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Philadelphia, Pa.

Editorial and Executive Offices
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New York, N. Y.

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Member, Audit Bureau of Circulations
Member Associated Business Papers
Indexed in the Industrial Arts Index.
Published every Thursday. Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 a year. Single copy, 25 cents. Cable Address, "Ironage, N. Y."

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THE IRON AGE

Contents

MAY 18, 1939

Threat to the Machine 11
A Job That Needs *Your* Help 63
Silence Gives Consent 65
German Metallurgical Problems 68
Leveling Peaks and Valleys in Power Boiler Plant 70
Indian Furnace Revamped 75
Chromium Plating Tractor Parts for Wear Resistance 76
Casing and Water Pit Trap Tumbler Dust 77
Metallurgical Aspects of Superfinish 78
Record Size Flywheels Weigh 95 Tons Each 80
Industry at the World's Fair 81
On the Assembly Line 90
Washington News 94
THE NEWS IN BRIEF 116
Weekly Ingot Operating Rate 122
Rate of Activity in Capital Goods 122
Plant Expansion and Equipment Buying 138

▼ ▼ ▼

Products Advertised 148
Just Between Us Two 149
Index to Advertisers 174

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... THE IRON AGE ...

MAY 18, 1939

ESTABLISHED 1855 Vol. 143, No. 20

A Job That Needs YOUR Help

YOU have seen "The Threat to the Machine" which is the subject of the special editorial insert commencing on page 11. This is the first of six graphic presentations which will portray time-saving machinery in its true rôle as an employment creator. By the time that this series is completed, it will give sufficient factual proof to convince any reasonable man that the existing unemployment is not due to mechanization but to the fact that we have overbalanced and destroyed the machine's constructive time-savings by profligate squandering of the accumulated savings of past decades. And what is more important is that if we do not change the attitude of the public toward the machine and put a stop to efforts to further handicap it, we may well find ourselves, in a few years, back to the producing and consuming level of 1850, instead of at the level of 1899 to which we have now retrogressed since 1930.

It is important, we believe, that these facts shall be spread as widely as possible. We shall see that they are given as broad a distribution as we possibly can give them, through newspapers, through sending them to state and national legislators and to molders of public opinion everywhere. In simplified and more popular form, they will also be made available to millions who visit the New York World's Fair.

You can help to spread this much needed gospel. See that the leaders of thought in your community are put in possession of the facts. As announced on page 19, we are making reprints available which you can place where you think they will do the most good.

See that the editors and publishers of your local newspapers have these facts called to their attention by personal contact. Doubtless they will receive our press releases on this subject, but there is nothing more effective than the personal follow-up. On receipt of a request, we shall be glad to send you a copy of the condensed press release prepared for this purpose.

One more way in which you can help, and a big one. We are living in a machine age. What we have we owe to mechanization, very largely. To time-saving machinery. Your own products could not be made without them and sold at their price.

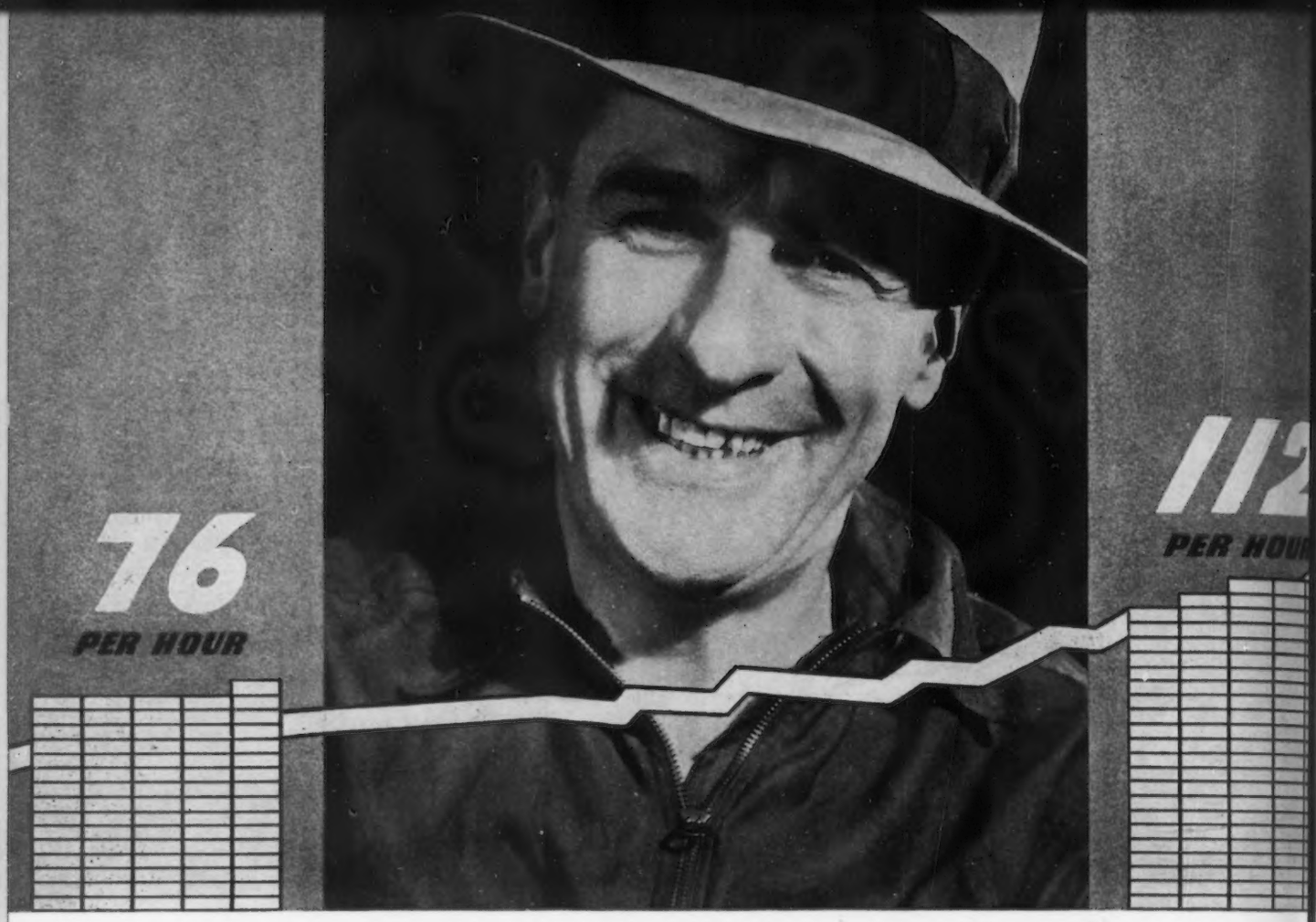
We should be proud of time-saving machinery in our plants; proud to call attention to the fact that we use it as widely as possible. Why not tell the public about it?

If you are a maker and seller of a nationally advertised product, we suggest that you run a line on every advertisement, put it on every circular and on each page of every catalog. A slogan reading

"Time-Saving Machines Made This Product.
Making This Product Made ..... Jobs."

Think of what that slogan, when associated with hundreds of products that are considered as indispensables, would mean to the public. And think of what the repetition of this thought, day after day in hundreds of places would do to public thinking with respect to machinery.

J. H. Vanderveen



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- tool life lengthened 50% to 200%.
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Silence Gives Consent

By WENDELL E. WHIPP

President and General Manager, Monarch Machine Tool Co., Sidney, Ohio; President, National Machine Tool Builders' Association

o o o

THERE is an old proverb to the effect that "Silence gives consent." What does this have to do with the machine tool industry?

This industry along with industry in general, has for some time been under attack. Repeatedly the charge has been made that machines destroy jobs. Again and again the public has been told that employers buy new machinery and equipment in order that they may throw workmen out in the street and thereby reap higher profits.

Is there an answer to this sort of accusation? Of course there is an answer, and a good one. You and I know that mechanization leads always, in the long run, both to increased employment and to lower prices for the comforts and conveniences that raise the standard of living.

But what is industry doing to present this answer to the public? What in particular is the machine tool industry doing in this direction?

Unless a sound answer is adequately presented, we can not blame the public if it assumes that "silence gives consent."

Why should the machine tool industry worry about this situation? Machine tools are not sold to the public. They are sold to manufacturers.

Makers of machine tools are nevertheless vitally interested in this picture for two reasons:

First—machine tool builders have enough sales resistance to overcome, as it is. If the force of public opinion consistently resists further mechanization, this adds additional ammunition to the sales defense of the manufacturer who persistently says "no."

Second—and this is infinitely more important—sales resistance to the buying of machine tools is based largely upon lack of confidence in the future. Lack of confidence is based upon political and legislative uncertainty. Political and legislative uncertainty are based upon the beliefs and the attitudes of the people who vote.

If the voters of this country were convinced that progress in mechanization, including the replacement of obsolete tools by new and modern machine tool equipment, would aid in the solving of our social and economic problems, it is my firm conviction that public opinion would rapidly force vital changes in the Government's attitude toward business, and thereby foster confidence in the future which would promote the buying of machine tools.

It is impossible to separate the outlook for the machine tool industry from the current state of public opinion. As long as public opinion damns mechanization, we will have laws impeding mechanization and hesitation upon the part of prospective buyers. If we can sell the public on the fact that mechanization is, in the long run, conducive to the welfare of all the people, the shift in the wind would take place almost over night.

At this late date it is unnecessary

to review the many and complex reasons which contributed to the fact that mechanization has fallen into disrepute with the public. The important question is one of how mechanization can contrive once more to regain in the public mind the high favor in which it formerly stood.

In the last few years, American industry as a whole and many individual industries such as the machine tool industry have made strenuous efforts in this direction. It is my conviction that they have made very substantial progress. I have the highest regard, for instance, for the accomplishments of the National Association of Manufacturers along this line. The machine tool industry has likewise, within the limitations of its size and scope of operations, done much in this direction.

A Straight-Forward Story

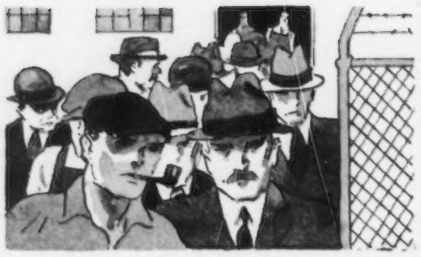
The story told by the Machine Tool Builders as well as by the National Association of Manufacturers has been an honest and straight-forward story. Both have endeavored to set forth before the American public the facts that research, invention and mechanization, instead of leading to bloated profits and smaller employment, have led in fact to increased employment and to lower prices for the comforts and conveniences which measure the standard of living.

The machine tool industry in particular has had a remarkably effective story to tell in this respect. The net accomplishment of machine tools has been to make possible the production of better products at lower cost—with consequent increased employment.

And yet, for some reason, the story of industry as a whole, and of the machine tool industry in particular, does not yet seem to have captured the understanding of the general public.

It is quite true that the people of this country have today begun to question seriously the theories of social and economic reform which have so long been dangled before them by the theorists in Washington. Obviously these theories have not worked. The people today seem somewhat bewildered at their failure. They seem at last to have a general conception of the fact that their own personal prosperity is dependent upon the prosperity of business—but they still appear to be groping in the dark as to why. Business has not yet succeeded in getting over to the public the relationship between progressive mechanization and progressive prosperity.

What is the reason for this stale-



mate? Why is it, for instance, that the public is now beginning to admit, on the one hand, that business must go forward if all are to regain prosperity, and, on the other hand, still suspects that further mechanization and modernization mean further technological unemployment, and profits for the few at the expense of the many?

The only answer I can see is that business has failed to make plain the relationship between mechanization and the welfare of the individual citizen. People realize now that in order to have ample payrolls and prosperity we must have good business. But they do not yet understand that in order to have good business we must have progressive mechanization. They do not yet realize that research, invention and mechanization are not merely the parents of better standards of living, but are also the parents of lower prices and better wages.

What's Wrong Here?

What is wrong in this picture? Somehow industry has thus far failed to paint its portrait in such a way that all the people can understand.

In seeking for an explanation, I have come to the conclusion that the chief difficulty has lain in the fact that industry has assumed an extent of public knowledge and understanding which does not in fact exist.

The machine tool industry, for instance, has told the public repeatedly how machine tools have cut the prices of countless devices which add to

human comfort and in the long run increase the number of men employed.

But what is a machine tool?

How many people actually know what a machine tool is?

Just a couple of weeks ago a nationally known woman author visited the plant of a leading turret lathe manufacturer. The executive conducting her through the plant proudly pointed out to her the company's current line of machines.

"Are these the things you sell?" she asked. He nodded.

"But what in the world are they?" she queried.

"Turret lathes," he responded.

"Turret lathes?" she echoed, in a vague way. "Well what are they for, and what do they do?"

For some years past this woman has been writing, for national magazines, articles on the subject of employment, standard of living, and welfare of mankind.

And yet further discussion with this author revealed the fact that never in her entire life had she had the slightest comprehension of what a machine tool was, or what it did. She had never even had any conception of the significance of the principle of interchangeability of parts. The whole chapter of the function of machine tools in the American scheme of living had remained to her a closed book.

Not long ago I happened to get in a discussion with a man who for many years wrote the business reviews published by an outstanding midwestern bank. He confessed to me that the first time he undertook to write a review of the machine tool industry he thought that machine tools were tools used to keep machines in repair—such as monkey wrenches and screw drivers.

What's An Engine Lathe?

A short time ago a gentleman of my acquaintance was seeking to interest a representative of a national broadcasting company in the radio reporting of a news event of considerable importance to industry. In the course of discussion the term "engine lathes" came up.

"What in Sam Hill is an engine lathe?" said the broadcaster. "I never heard of it."

Not long ago a prominent banker had occasion to visit our own plant. In the course of his visit he confessed to me that in spite of the fact that his bank had for many years carried the accounts of various machine tool

builders, he never yet had been inside a machine tool plant.

Now, if national writers on social and economic affairs, bank reviewers, people who govern radio broadcasts, and practical bankers, do not know what a machine tool is or what it does—what can you expect of the general public?

Of course the thousands of men who work in our industrial plants know exactly what a machine tool is and what it does. But these people do not constitute the majority of our population.

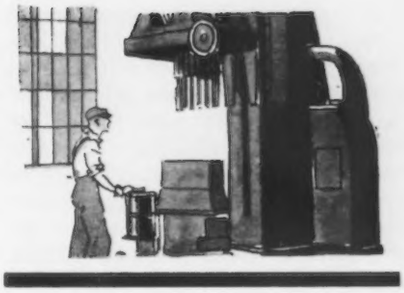
What about the professional men? What about the people engaged in retailing? What about the farmers? And more important than all these put together—what about the women who never get inside a factory, but who represent an all-powerful element in public opinion, and whose votes are just as important as are those of our entire male population?

What Weight Argument?

Are these people who know nothing about machine tools—who have not the slightest conception of what they are or what they do—in the least affected by the statement that machine tools make modern conveniences available to the public at lower prices, and over a period of time increase employment?

Such arguments do not reach these people, because they do not yet know what a machine tool is and what it does. The industry must explain that machine tools remove metal; that they remove metal in order to make the parts which are assembled into modern comforts and conveniences—and that without sufficient accuracy to permit interchangeability of parts and mass production, modern comforts and conveniences simply could not be given to the public at today's prices. With this finally made plain, the industry then could proceed to pound home the story of how prices of consumer products go down as productivity increases, and employment mounts as lower prices continue to attract a broader volume.

I must admit that if most of the public does not understand machine tools, the fault has lain largely with the machine tool industry itself. It is only natural that machine tool builders, selling only to manufacturers and not to the general public, should not hitherto have been particularly exercised over public education or public opinion.



Furthermore, a great deal of the terminology which has been employed by the machine tool industry has contributed to a faulty interpretation upon the part of the public.

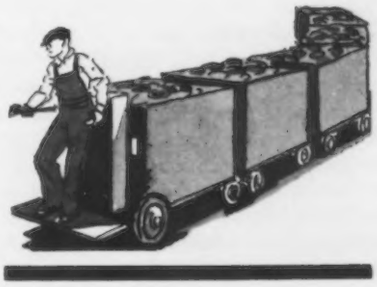
We have said that machine tools "cut labor costs." The assumption by the public has been that a manufacturer installs a machine tool which will do the work formerly done by men, and throws men out of employment. You know, and I know, that when we refer to "cutting labor costs" we are talking in terms of "labor cost per piece of product produced." In other words, if a manufacturer, through the use of machine tools, can cut the production costs of a product, he can likewise cut his selling price. By so doing he may increase his volume.

The fact is that in countless numbers of cases a manufacturer, by cutting his "labor costs," has actually been able to increase immediately his number of men employed. He has cut his production costs on his product —and thereby added to his market, his volume, and his employment.

Increased Productivity

But the phrase "cutting labor costs" is an unfortunate expression. What machine tool builders have to offer is "increased productivity per man employed." Another way of stating it is to say that machine tools can cut production costs and thereby cut selling price.

Of course in this process machine tools also add to profit. But I do not



believe for a moment that the American public will resent profits, if these profits are gained by a reduction in sales price, an increase in volume, and an increase in employment.

Machine tools have been known to the world as "labor-saving" devices. The phrase "labor-saving" has been given an unfortunate twist by so-called social reformers. The connotation of the phrase has been that men are fired and their places taken by machines.

I think it is time that not only machine tool builders, but all industrialists, should endeavor to present the phrase "labor-saving" to the American public in terms of its true meaning.

A "labor-saving" device is literally a device which saves labor. Machine tools constitute a perfect example. By the use of machine tools labor is performed which, in the old days, required literally the strain and sweat of thousands of workmen. Today machines do the hard work which formerly was done by men. All that men have to do today is to manipulate levers—the machines do the actual work.

It is not a simple or an easy proposition to present all of these facts and ideas effectively to the American public. In these days—with so many items clamoring for the attention of every reading and listening person, in the newspapers and on the radio—real effort must be brought to bear upon an educational program, if this program is to make any substantial dent upon public consciousness.

It is my hope, however, that the machine tool industry will place increased emphasis upon a permanent program of education of the American public. I think that the industry must make clear to the people of this country what a machine tool is; what it does; and why it is conducive to the progress and prosperity of mankind.

Concrete Proof Wanted

The people have had laid before them every possible sort of conflicting theory, every imaginable type of panacea, every conceivable plan pointing a way out of the wilderness.

From now on it seems to me any group which intends or expects to convince the American public of its way of thinking must advance clear-cut proofs in terms which any person can understand, and press these proofs upon the attention of a tired and bewildered public.

That, to my mind, is the major challenge before the machine tool industry today.

German METALL

BY Paul Lindenberg

PHOSPHORUS and sulphur are, generally speaking, the nightmare of every iron metallurgist and blast furnace man considering that these elements will produce cold brittleness and red shortness when present in iron. During blast furnace operation, the pig iron absorbs sulphur in large quantities and therefore the desulphurizaton of pig iron, after tapping off and prior to its further working, is of the utmost importance.

Desulphurization is carried out in Germany by means of the sodium carbonate process, which yields a very low sulphur content in the pig iron, if so required. In practical operation, the most beneficial ratio has been found to be about 0.8 per cent of Na_2Co_3 to 0.1 per cent S. In order to obtain a thorough chemical reaction, a steady stream of sodium carbonate is poured on the liquid pig iron during the whole tapping procedure, a somewhat lower tapping temperature contributing to better desulphurization. The best time period for the chemical reaction is about 6 to 10 min., which should not be exceeded because of resulphurization danger. To keep down iron losses as much as possible, a carbon admixture in the amount of 20 per cent to the Na_2Co_3 quantity has given satisfactory results. This process has been improved considerably by the use of hot liquid sodium carbonate, which not only facilitates desulphurization but also considerably reduces heat losses during the reaction.

Desulphurization by the sodium carbonate process had its beginnings simultaneously in Germany and Great Britain, where it had been initiated by the well known firm of Brassert & Co.; in the meantime this process is making its way all over the Continent.

This particular method affords also another essential advantage: it fully eliminates the need for an extra addition of manganese ore (which Germany must purchase from abroad) to the burden mixture of the blast furnace, and thus accordingly does away with the monopolistic position of certain countries owning most of the world's manganese ore deposits —a rather interesting and desirable consequence of modern metallurgical achievement.

Sodium metasilicate likewise has a strong desulphurizing effect on pig iron, while an addition of lime to the metasilicate will considerably improve this effect in view of the fact that the lime combines with the silicic acid. Another desulphurization possibility results from an admixture of strontianite to the limestone flux, there being far better desulphurization during the smelting process in the blast furnace than would be possible with the limestone addition alone. In addition, there is brought about an improvement in the pig iron quality.

However, German low grade iron ores usually also contain a comparatively high amount of silicic acid, and this fact has compelled German metallurgists to discard customary blast furnace operation with abundant basic slags, which has been accepted the world over for nearly a century. It may be stated in this connection that in Germany the age-old blast furnace processes have been taken up again, when low grade ores with a Fe content of about 20 to 25 per cent and a high silicic acid content were worked profitably, notwithstanding the fact that the slag contains silicic acid to the extent of about 50 to 60 per cent.

The change-over to the smelting of acid iron ores, as well as slags of an entirely different nature, have brought forth quite a few new problems, as for instance reduction in heavy iron losses in slags with a high silicic acid percentage within the blast furnace. Furthermore, smelting of poor iron ores, and especially of those from the Salzgitter area, with a comparatively low phosphorous content, has led to the problem how to work successfully such pig iron without the admixture of phosphates or basic slags.

The only method for converting very large quantities of pig iron into steel at reasonably low costs is still the basic Bessemer process, and when steel is made from pig iron secured from low grade ores the refining in Bessemer converters, with the application of compressed air for the removal of detrimental components by oxidation, must be used also in the future. It is interesting to note that large-scale production on a continuous flow principle has now been developed, which makes use of a refining vessel designed in accordance with the latest practical experiences. This vessel converts pig iron into steel, the liquid pig iron being brought continuously to one end of the vessel and discharged in a refined state at its other end. This process, moreover, is said to yield the valuable element vanadium, a very important steel refining component, and one which ranks with manganese, tungsten, chrome, nickel, cobalt and molybdenum as an alloying element.

German Dogger ores and other ore deposits are said to contain fairly considerable percentages of vanadium, which can be recovered in sufficiently large amounts to substantially reduce the consumption of other steel refining materials. Further problems are: vanadium recuperation from basic Bessemer pig iron, the use of other manganese-containing ores instead of high-grade and expensive manganese, and the production of pig iron to contain but a small amount of manganese.

The scarcity of alloy metals in German mineral resources for steel refining materials has caused comprehensive researches into the effect of

various alloying elements on steel. Excellent results are said to have been obtained with regard to case hardened and annealed steels on the basis of alloys with a very low nickel content. Also, according to available reports, high-grade heat resisting steels are being produced without any admixture of nickel, while high speed steels are obtained with an insignificant percentage of tungsten or no tungsten at all, there being small additions of molybdenum and vanadium.

TALLURGICAL PROBLEMS

Duesseldorf, Germany

Another German metallurgical problem is the recovery of sulphur and zinc as by-products when working low grade ores with a poor lime and a high sulphur percentage and showing, moreover, some spelter.

The latest Four Year Plan makes compulsory the smelting of poor inland iron ores. This requirement has resulted in a drop of pig iron production estimated at about 30 per cent of the total output. This is not bearable from an economic point of view. The reason is obvious: bulky ore burdens with a small percentage of Fe had to be placed within a useful blast furnace space designed for normal operation and which evidently had become too restricted for the new kind of smelting process. Therefore, measures were taken which, in part, differ very much from former operating conditions in view of the poor iron and lime content of the ore requiring a far bulkier ore burden, with more limestone and higher coke consumption, besides the resulting large slag quantities, all of which meant an overload of the available furnace space. On the other hand, the troublesome fact had to be coped with that some inland ores tend to develop heavy dust formation within the furnace.

Comprehensive and large-scale practical tests have been carried out by German smelting and iron works in order to overcome all these difficulties. This work has resulted in the knowledge that prior to the smelting the raw ore must be submitted to a suitable dressing treatment consisting of roasting, sintering or calcining. There is obtained thereby a considerable saving in coke and limestone consumption, with reduced dust formation in the blast furnace, and an improvement at the same time in the Fe content. It has thus become possible to increase output and keep down production costs. Another auxiliary to this result was the application of oxygenated blast air, i.e., air with an added oxygen volume, and this has also contributed to reduce coke consumption and to increase output. It is said that with this method there is a saving of about 18 to 20 per cent in coke, as compared with normal blast air operation, and the furnace output is stated to have been enhanced by some 45 to 50 per cent. The preliminary dressing and burnt lime admixture apply also to the Salzgitter ores, and has lowered their smelting costs accordingly.

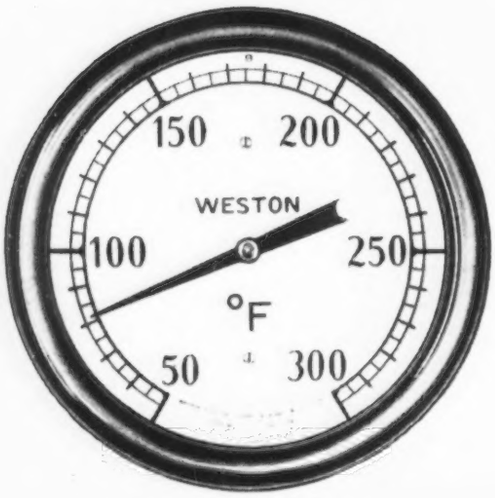
The fuel saving problem has led to an intensified utilization of blast furnace gases for the aforementioned dressing work, the gases accruing in huge quantities from inland ore smelting. Operating data from several lime kilns fired with these blast furnace gases have shown that the lime thus burnt is fully suitable for smelting purposes, affording even certain metallurgical advantages, as for instance reduction in sodium carbonate consumption for desulphurization.

The useful disposal of the increasing slag accumulations as a result of the forcibly stepped-up poor inland ore smelting confronted German metallurgists with yet another problem. Slags from acid smelting have been found to be suitable for the making of paving stones and the slag originating with sodium carbonate desulphurization may be used in glass production. Furthermore, it seems that the blast furnace foam slag will yield a convenient material for structural concrete and for lime fertilizers. According to Salzgitter ore smelting tests, mixed slags, i.e., a mixture of acid and basic slag, has turned out to be a valuable road construction material, while granulation tests of acid slag are said to have given quite satisfactory results.

In most countries with rich iron ore deposits, steel production is considerably higher than pig iron output in view of the fact that steel-works are using scrap for their furnace charges in rather large quantities, along with pig iron. Scrap in Germany averaged during the past few years about 60 to 65 per cent of the iron yield from smelted ores. With technical development progressing apace, the demand for iron and steel will increase accordingly and consequently the importance of scrap will be enhanced as a keen competitor to iron ore. Only that quantity of iron and steel which is entirely destroyed by atmospheric corrosion and oxidation should be considered as a total loss to national economy. Therefore, energy is directed toward the production of rust-proof and corrosion resisting grades of iron and steel—at a reasonable market price—another nut to crack for metallurgists in Germany and abroad.

Mining engineering is still constantly being called upon in Germany to increase to the utmost iron ore extraction at lowest possible costs, and dressing engineers are busy discovering the best and least expensive procedure to furnish suitable smelting ore. These are a few of the most urgent problems actually prevailing in the metallurgic activities of Germany, but many other problems exist which cannot be considered at the present time.

STAY WHERE YOU ARE!



No "close-ups" necessary to accurately read

WESTON

INDUSTRIAL TEMPERATURE GAUGES

NOW you can have *readable* temperature gauges *wherever* you use indicating thermometers . . . for these gauge-type WESTONS are available for all standard wells and fittings. Mounted on overhead lines . . . on equipment in out-of-the-way places . . . they are more conveniently, more easily read because of their large, round scales and bold scale markings. » » » They provide other advantages, too, *equally important*. They resist breakage, because of their *all-metal* construction. They maintain their accuracy because of the scientific WESTON all-metal temperature element, which also resists damage from over-temperatures. And their stainless steel stems assure long life where corrosion is present. » » » A booklet is available giving complete data on these sturdy, easy-to-read thermometers. Be sure to send for your copy. Weston Electrical Instrument Corp., 654 Frelinghuysen Avenue, Newark, New Jersey.

WESTON INDUSTRIAL TEMPERATURE GAUGES

JUST BETWEEN US TWO

Beating the Gun

Of all the salty remarks credited to Al Smith, the wisest is this, *"Don't get too far ahead of the parade or no one will know you're leading it."*

Which makes us suspect that your favorite family journal's practice of being the first, usually, to break the news of important developments has its weaknesses. Sometimes we spark before the cylinder is in full compression.

Take, for instance, that sparkling series on Chrysler's Superfinish we ran last September. It didn't explode nearly as loudly as we thought it should have, but six months later, at the American Society of Tool Engineers' convention, it was the Little Egypt of the show.

Incidentally, this 17-page series is still, we believe, the most definitive report available on Superfinishing. If you want a reprint of it, mail in a dime to cover postage, and we will dust off a copy.

Not Separate Apart

The Chrysler people did not make our mistake. They waited until Superfinish was in full bloom before introducing it into their advertising. It is now being used—redundantly—thus, *"These Superfinished discs are so smooth they adhere together."*

We Eat Crow

Speaking of inexact expression, a slip of ours brought a painful rap on the knuckles from the editor of a well-known house organ issued by an Ohio manufacturing firm.

In a recent item we gave the impression that we believe those who receive house organs should be asked if they wish to continue. As a house organ is a sales weapon, what we intended to say, and didn't, was that those on the mailing list *who are neither customers nor prospects* be asked every now and then whether they wish to continue as recipients.

To address this question to those who can use a product to advantage would be equivalent to asking, *"May we continue to try to sell you?"* Which belongs in the same category with the command, *"I am not interested. Please tell your salesman to stop calling."* Both are termites in the structure of private enterprise.

Fortunate Machinery Builder

Next week we will publish the first of a series of six articles on the job-creating power of modern equipment. A Midwestern manufacturer who was apprized of that fact writes:

> *"We are not interested. We have a rather small factory and are fortunate in having practically no machinery."*

He makes machinery—floor machinery.

His Kampf

For years now a purist on the staff of this journal has been conducting a one-man campaign against the word *"proven"* as the past participle of *"prove."* Whenever it creeps into any of our own advertising or letters he blue pencils it and notes acidly, *"The word is 'proved.' 'Proven' is the second word of the Scotch verdict."*

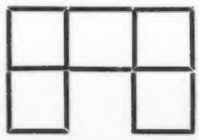
"Proven," being easier on tongue and ear, is rapidly replacing the harder form. We thought it was something new, but we see that this journal, always quick to sense a trend, employed it as far back as Jan. 23, 1873, in the phrase, " . . . . *was not satisfactorily proven.*"

Kidney Punch for Grammar

But that might not prove anything, as our founder was not one to let grammar get in his way when he had something to say. He had quite a tussle with the word "firm," meaning a business, and could not quite make up his mind whether it was singular or plural. So he compromised, using a singular pronoun with the plural form of verb, giving birth to such an orthographical oddity as *"This firm are . . ."*

Puzzle

Pick up three matches, place them in another position, and reduce the number of squares to four. Par is four minutes.



—A.H.D.

MAY 18, 1939

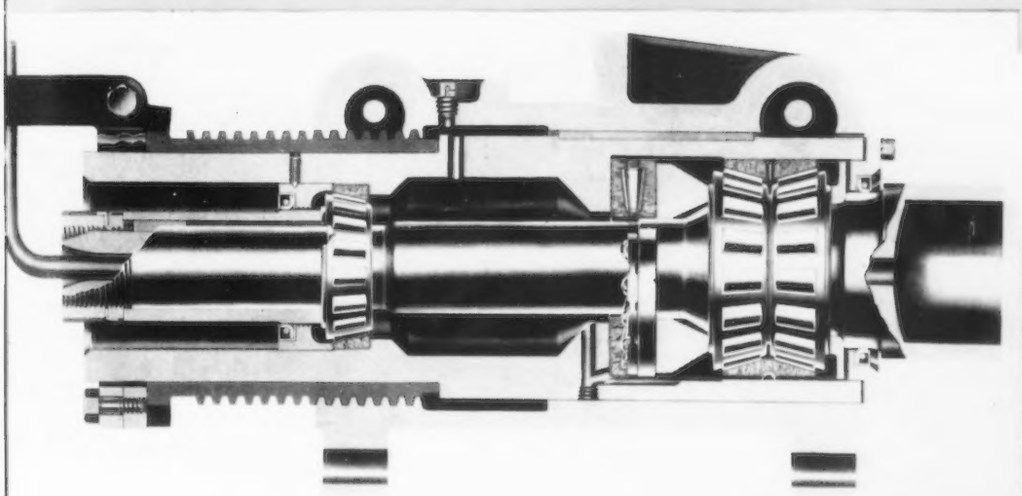
JUN 15 1939

THE IRON AGE

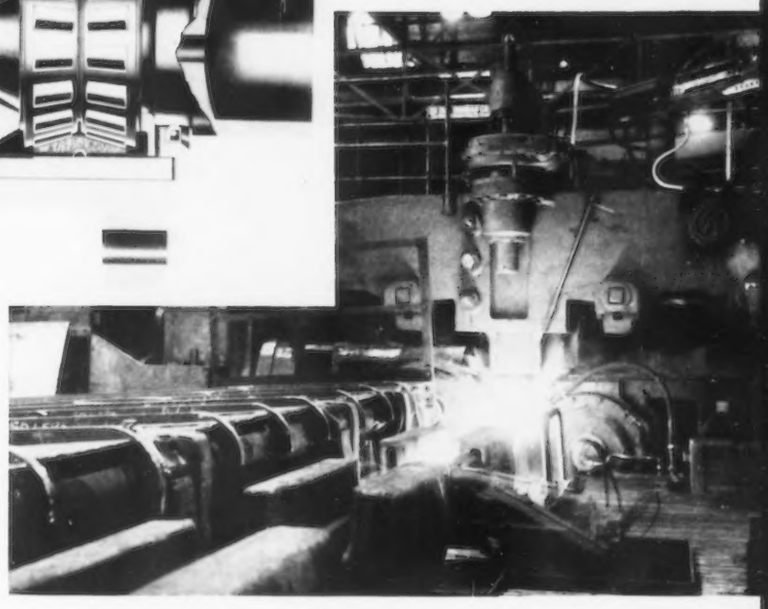
IMKEN Bearings Improve Production - Reduce Cost In Modern Seamless Tube Mills

Tapered Roller TIMKEN BEARING EQUIPPED

A symbol of quality for any piece of equipment with which it is associated



application of TIMKEN Bearings to a piercing mill thrust block.



Close up of a modern Timken Bearing Equipped piercing mill built by Aetna-Standard Engineering Company and operated by the Youngstown Sheet & Tube Company.

application of TIMKEN Tapered Roller Bearings ne of the greatest improvements ever made in cing equipment for the production of seamless ing. In fact the use of TIMKEN Bearings has eased piercing mill efficiency to such an extent no mill can be called really modern unless it imken Bearing Equipped.

KEN Bearings are used on piercing mill roll necks in thrust blocks to promote greater accuracy, urance and economy. With friction and wear inated; radial, thrust and combined loads adetely taken care of; and permanent alignment of moving parts assured, operating speeds can be higher . . . maintenance costs are lower . . . power consumption is reduced.

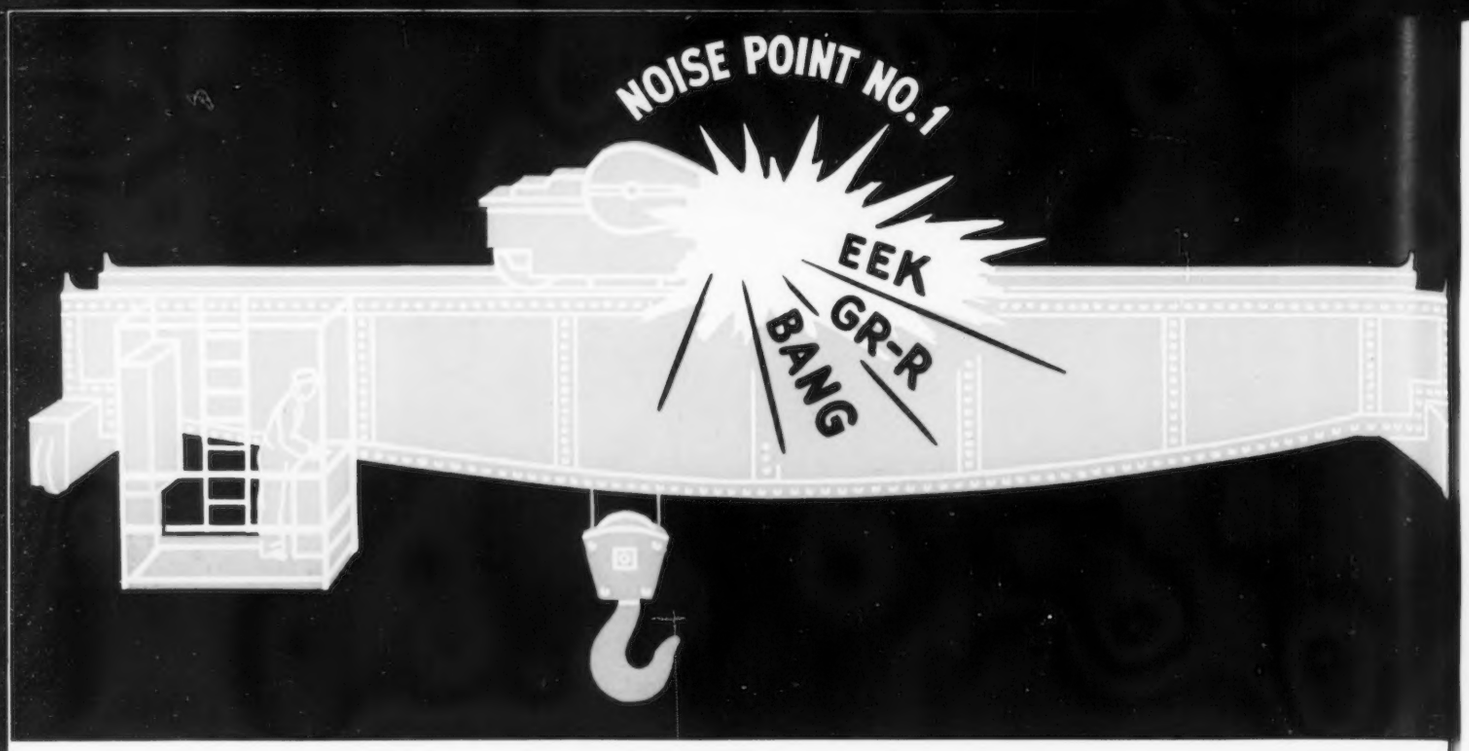
If you are considering the purchase of a new seamless tube mill make sure that it will be truly *modern* now and for many years to come—specify Timken Bearing Equipped.

TIMKEN

TAPERED ROLLER BEARINGS

The Pennsylvania's new Broadway Limited rolls on TIMKEN Bearings.
GLIDE—as you ride a Timken Bearing Equipped train

E TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO



This NOISE in your crane means WEAR!

Noise in itself may not be objectionable in your crane. But it is an indication of *wear*. And wear means eventual failure, production delays, and high maintenance costs.

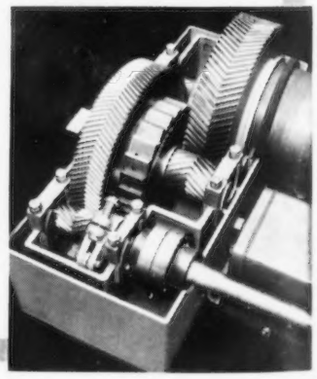
At the vital "Noise Points"—points that become noisy in ordinary cranes—Whiting has taken special precautions to eliminate wear. Frictionless roller bearings accurately maintain gear centers. Herringbone gears quietly transmit loads. Tapered tread drive wheels insure free travel, and flexible couplings transmit power without binding.

Listen to an ordinary crane, then listen to a Whiting. You will realize why Whiting cranes give low cost operation and long life.

WHITING CORPORATION
15601 Lathrop Avenue
HARVEY, ILLINOIS

Herringbone Gears reduce Noise and Wear in Whiting Cranes

At Noise Point No. 1 — the hoist speed reducer — Whiting cranes use herringbone gears. The smooth rolling action secured by continuous contact of the herringbone teeth reduces friction and noise, cutting gear wear. These gears ordinarily outlast spur gears 2 to 1. Only two reductions are necessary, instead of three or four, giving a simple, compact, and efficient speed reducer mechanism.



HOW TO WRITE a Traveling Crane *Specification*

Send for your free copy. Contains complete information on how to specify a crane for your needs.

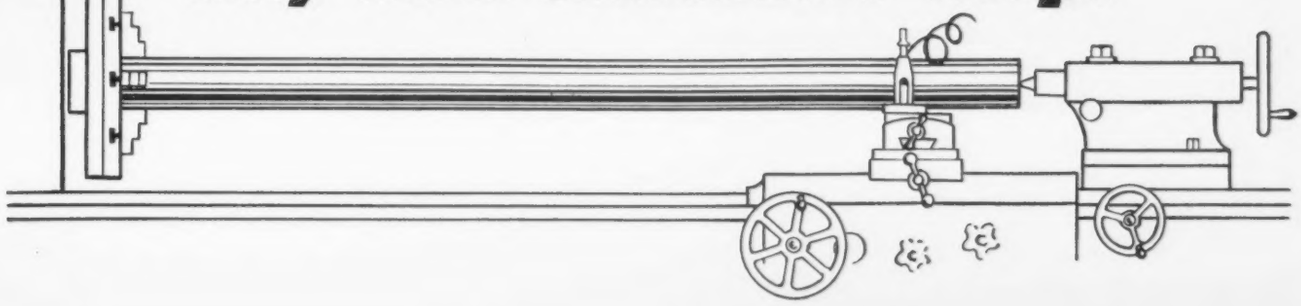
CAPACITIES 1 TO 400 TONS

IT PAYS TO GET A QUOTATION ON

WHITING

OVERHEAD TRAVELING CRANES

Why steel sometimes warps



Stress-relief anneal will usually prevent it

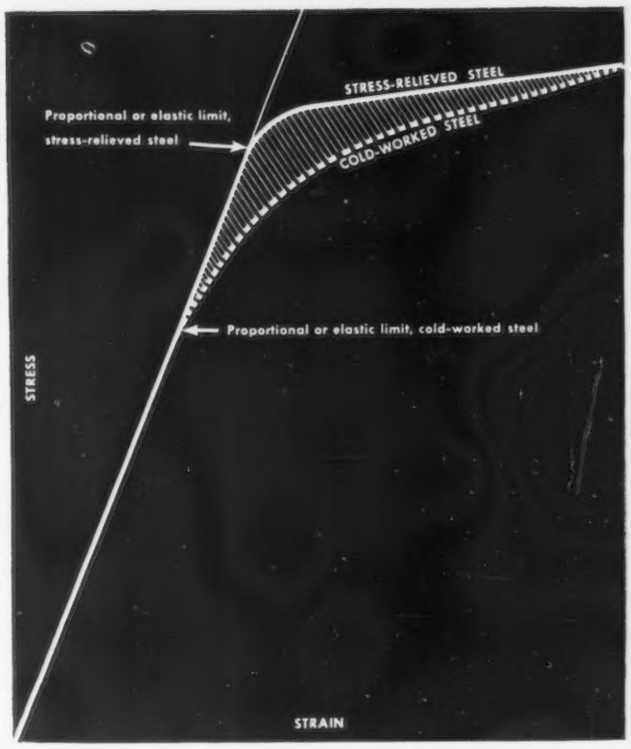
FROM time to time machine shops complain of warpage or distortion when machining steel bar stock. This is usually noticeable only when the part is long. It occurs on "as-rolled" or heat-treated bars which have been machine straightened and on cold-drawn bars, especially where key-ways are cut. The harder or stronger the material, the more likelihood of trouble.

Cause. The cause is not a defect in the metal, but rather stresses set up within the steel by straining it beyond its elastic limit. Machine straightening a bar will do this, as will cold forming or cold drawing. Even the cold working that the steel receives by heavy machine cuts may be the cause of such warpage.

Remedy. The remedy is to relieve such stresses before machining (or between machining operations, if heavy cuts are taken). This can usually be accomplished by a low-temperature or stress-relief anneal.

Such an anneal will usually be carried out at a temperature between 800 and 1100 deg. F. Obviously, on quenched-and-tempered parts, the temperature should be held approximately 100 deg. F. below the tempering temperature to avoid softening the steel.

Effects of this sub-anneal. A stress-relief anneal will have no harmful effects on the steel. To a limited extent it may improve the physical properties. Note the curve above. The elastic limit, or point where the stress-strain curve leaves a straight line, is lowered by cold-working steel. A stress-relief anneal will raise this point until it approaches the yield point. Little difference will be noticed either in yield point or tensile strength. Ductility, if changed, will be improved.



Effect of stress-relief anneal (shaded area). It raises the elastic limit without noticeably affecting yield point or tensile strength

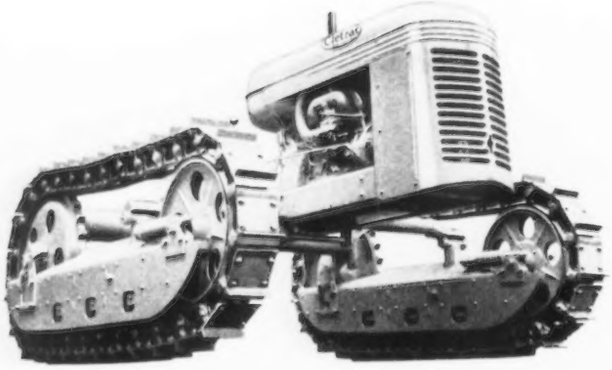
Metallurgical advice. A call to the nearest Bethlehem office, or a letter to Bethlehem Steel Company, Bethlehem, Pa., will bring metallurgical advice on this or other subjects. To make use of this service places you under no obligation.

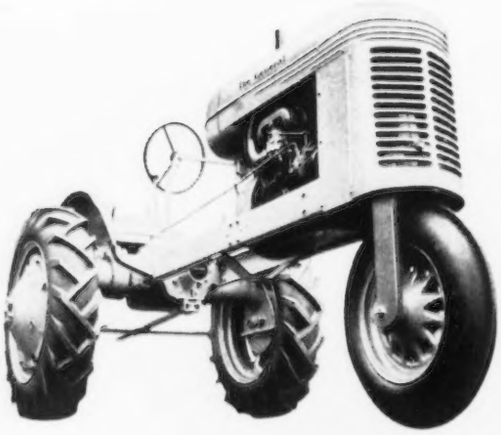
BETHLEHEM STEEL COMPANY

THE IRON AGE, published every Thursday by the *CHILTON CO. (INC.)*. Publication office, Chestnut & 56th Sts., Philadelphia, Pa. Editorial and Executive offices, 239 W. 39th St., New York, N. Y. Entered as second class matter November 8, 1932, at the Post Office at Philadelphia under Act of March 3, 1879. $6.00 a year in U. S., Canada $8.50. Foreign $12.00. Vol. 143, No. 20.

39Y584

FOR 10 YEARS CLETRAC ENGINEERS HAVE PROPERLY PROTECTED BEARINGS WITH "PERFECT" OIL SEALS





THE conditions under which a tractor normally operates are as severe for bearings as those encountered anywhere. Dust, mud and water are always ready to attack. Temperatures may be extremely high or very low. High load concentration and impact stresses are unavoidable.

Cleveland Tractor Company for ten years has given tractor bearings the best protection available by equipping them with "Perfect" Oil Seals. The new "General" and the Cletrac Crawler illustrated here carry these seals on all lower track wheel idlers, front wheels, steering lever shaft, rear wheels, main drive shaft, transmission, and other points requiring lubricant retention and protection against dust and moisture.

In view of the low cost of such protection, every bearing should be equipped with seals of this type. Let Chicago Rawhide engineers study your bearing applications.

CHICAGO RAWHIDE MANUFACTURING COMPANY

1306 ELSTON AVENUE, CHICAGO, ILLINOIS

60 Years Manufacturing Quality Mechanical Leather Goods Exclusively

PHILADELPHIA CLEVELAND NEW YORK DETROIT BOSTON PITTSBURGH CINCINNATI

Machines Make Jobs AND BETTER JOBS

The more highly mechanized a plant is, the more it contributes to employment, the lower its unit costs, and the higher the annual wage is apt to be.

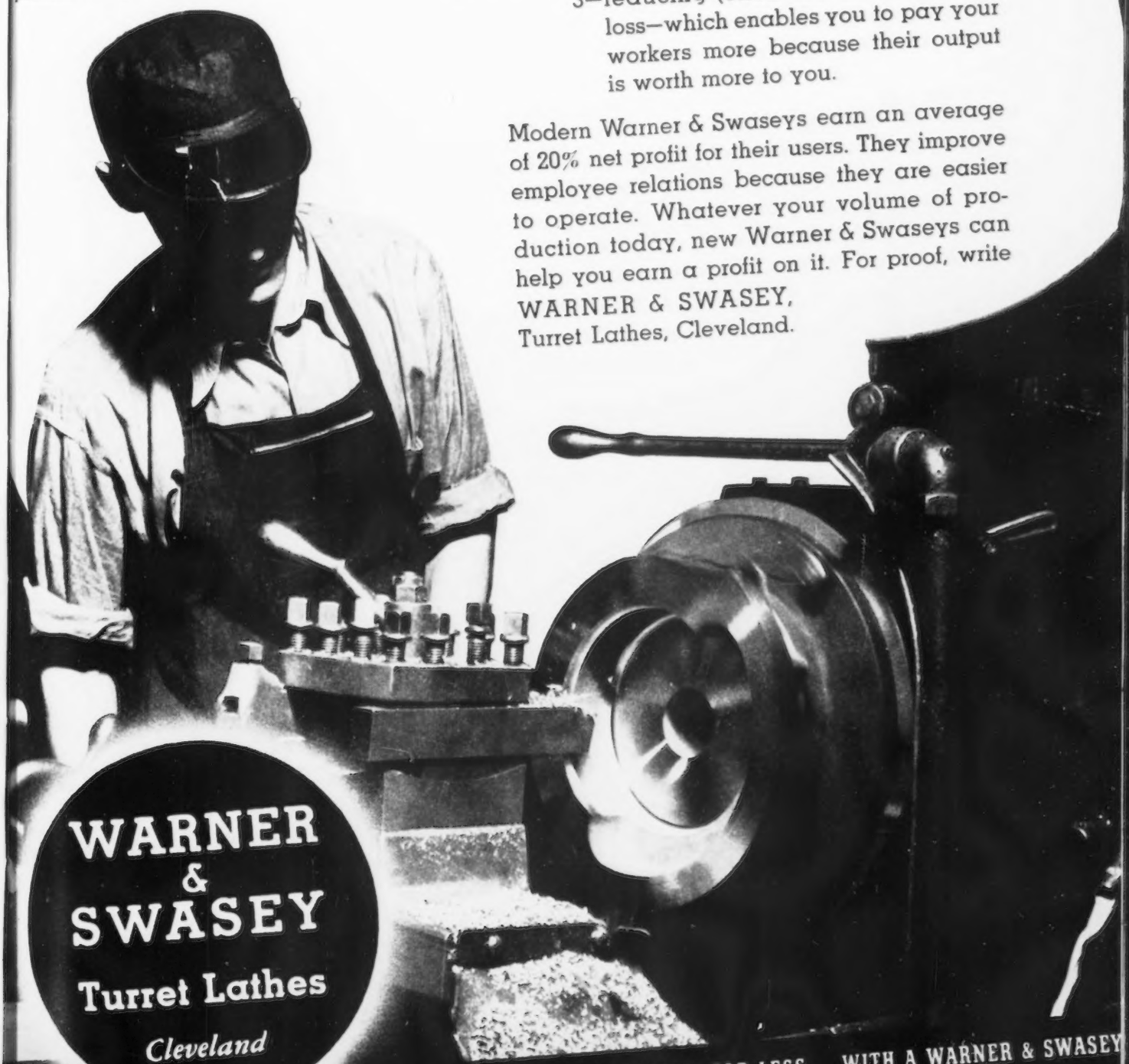
Modern Warner & Swasey Turret Lathes can help *you* improve employment, orders, profits, wages, by—

1—cutting cost per piece as much as 50%—which puts you in better competitive position to get and hold business.

2—improving precision and quality of your product—which again helps you get orders.

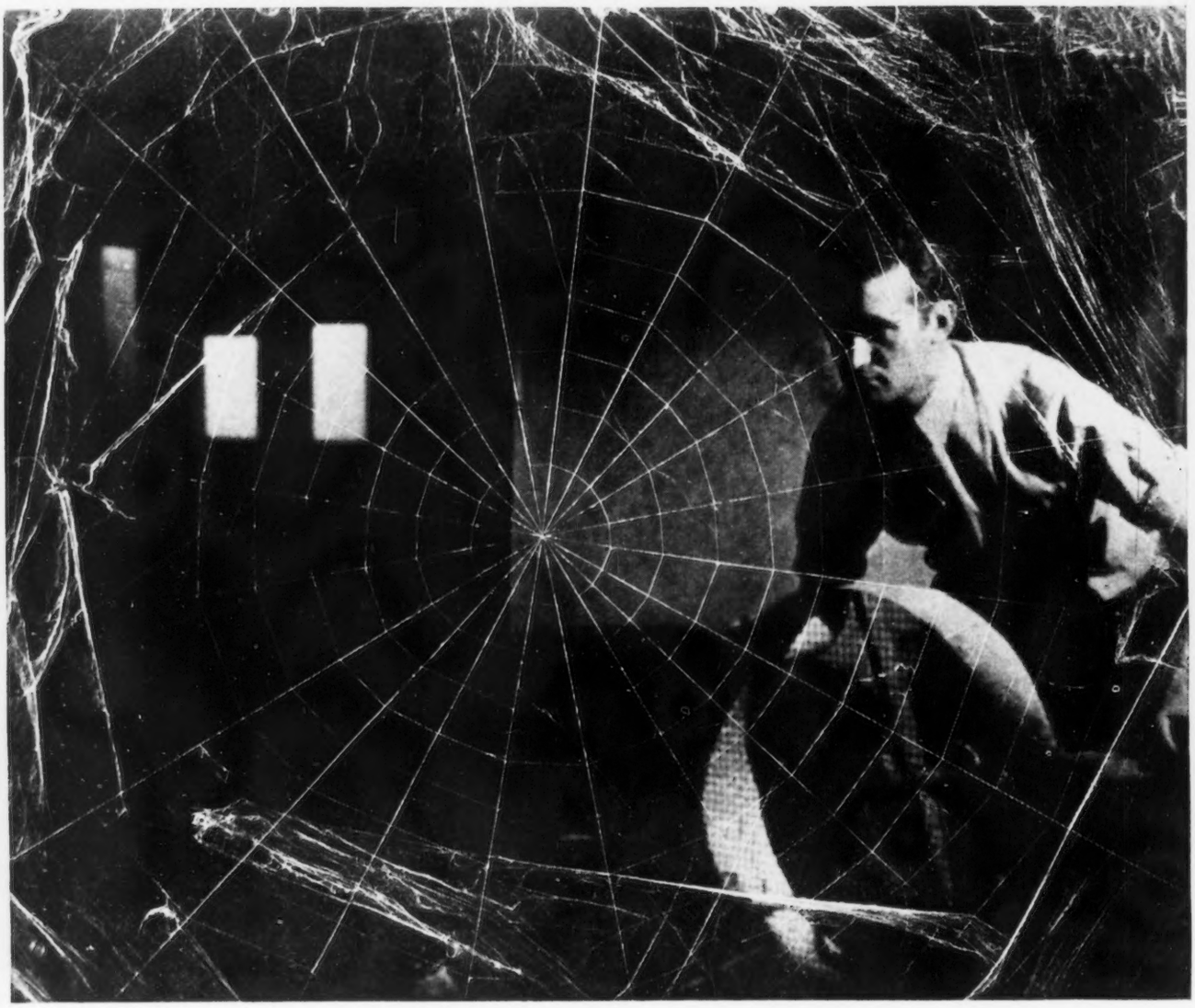
3—reducing (often eliminating) scrap loss—which enables you to pay your workers more because their output is worth more to you.

Modern Warner & Swaseys earn an average of 20% net profit for their users. They improve employee relations because they are easier to operate. Whatever your volume of production today, new Warner & Swaseys can help you earn a profit on it. For proof, write WARNER & SWASEY, Turret Lathes, Cleveland.



WARNER & SWASEY
Turret Lathes
Cleveland

YOU CAN TURN IT BETTER, FASTER, FOR LESS . . . WITH A WARNER & SWASEY



The Hollywood spiders are on relief

A typical example of Goodrich development in rubber

HOLLYWOOD movie scripts sometimes call for spider webs. But spiders can't be lured with fat contracts, don't understand the importance of production schedules. They proved more temperamental than any movie heroine—and whole casts could be held up, waiting for a spider to spin a web.

Then a technician at Metro-Goldwyn-Mayer thought of making spider webs of rubber cement. Experimenting, he forced the cement through a tiny hole where he caught it in the blast of an electric fan, and by moving the fan up and down, in and out, learned how to weave webs of which any spider could be proud.

But to make webs of life-like gossamer, the rubber cement had to be extraordinarily uniform so it would not clog. And it had to be of the right natural color, had to remain stable, and had to be of such great tensile strength that even in tiny threads it could stand jarring and wind during the movie without the breaking of a single thread.

The studio came to Goodrich for their cement, and Goodrich had exactly the product they needed. You probably have seen many a spider's web in moving pictures, made of Goodrich rubber cement . . . It illustrates the principle applying to all Goodrich products: research to improve life, tensile strength, uniformity, every property of rubber goods goes on continuously here. *All* the resulting discoveries are immediately available to all Goodrich products, so that you can be sure of getting the latest developments, the utmost value, simply by specifying *Goodrich* to your Distributor. The B. F. Goodrich Co., Mechanical Rubber Goods Division, Akron, Ohio.

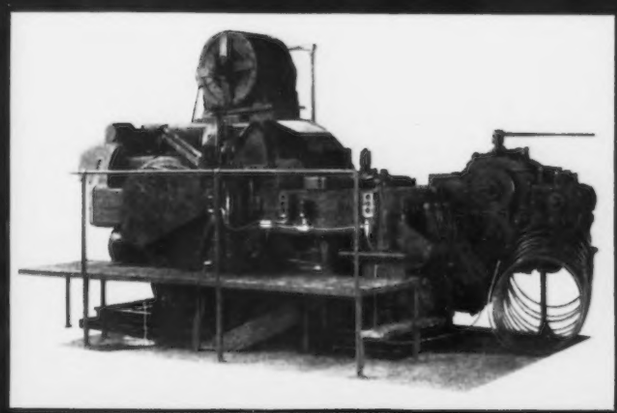
Goodrich

ALL *products problems* IN RUBBER

TOPS IN TOOL STEELS

Proper Tooling Pays here!

(Photo and data furnished through courtesy of Rockford Screw Products Co.)



A FINISHED BOLT FROM 1" ROUND—

Every time the clock ticks

VASCO TOOL STEELS

plus

METALLURGICAL ASSISTANCE IN THE SELECTION IS THE WINNING COMBINATION

For the extruding dies, heading dies and heading punch, VASCO-LATROBE was selected because of its fine grain and uniformity. It is practically a made-to-order steel for this type of work. Tools illustrated appear in the order named from right to left across the page.

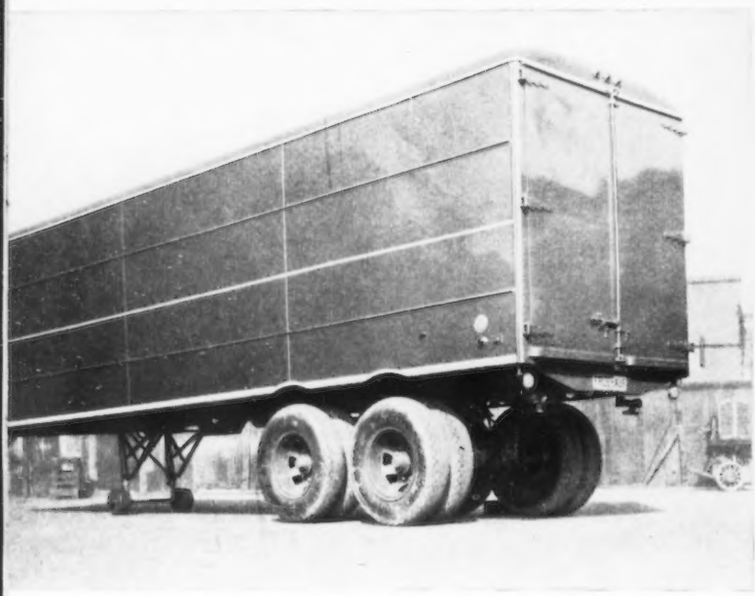
For the trimming dies, pointing tools and thread rolling dies, RED CUT SUPERIOR was selected. Ability to hold an edge at high temperatures and exceptional resistance to abrasion insured good production before the first bolt came off the machines.

VANADIUM • ALLOYS

STEEL COMPANY... LATROBE, PA.

IT'S A DARE!

Weigh



1800 lbs. lighter—carries 1500 lbs. more payload. Ultra modern design utilizes U·S·S COR-TEN in the bridge-truss type body frame. Reduces weight of this Fruehauf freight trailer 1600 lbs. under standard. Compared with old equipment now on the roads, the weight saving is estimated to run as high as 4000 lbs. Unit is 33' long, 8' wide, 7' high—weighs only 10,900 lbs. Built by Fruehauf Trailer Co. of California.

Hyster Boom-Arch built 20-30% lighter with U·S·S MAN-TEN. In this modern logging equipment, built by Willamette-Hyster Co., Portland, Oregon, the high yield point of U·S·S MAN-TEN makes possible substantial weight reduction without reducing high load capacity and great strength essential for this tough service. Saving weight leaves more horse-power available for work—permits faster return trips and safe operation up steeper grades. Increased footage handled, assures low cost operation essential for selective logging.

U·S·S MAN-TEN *reduces weight one-third, assures long life.* Vital in obtaining favorable payload-deadweight ratio in the face of highway load limit restrictions, the use of U·S·S MAN-TEN enables builder to reduce thickness of mixing drum and mixing blades of this Blaw-Knox TRUKMIXER by 33 1/3%. Abrasion tests reveal MAN-TEN also ideally suited to withstand the grinding action of sand, stone and cement—one reason why none of these drums or mixer blades has ever worn out in service.

U·S·S MAN-TEN *saves 3750 lbs. in this mine truck body.* 25 cu. yd. trailer dump truck for open strip mine hauling, built by United Iron Works Company, Pittsburg, Kansas. Body of U·S·S MAN-TEN weighs 14,800 lbs.—25% lighter than similar capacity trailer with structural quality steel body.

Any truck body user will be interested in a steel that will economically reduce deadweight like this. Weight saved can be converted into gasoline and oil savings, reduced tire and brake maintenance, extra carrying capacity.

U·S·S HIGH TENSILE STEELS

U·S·S COR-TEN · U·S·S MAN-TEN · U·S·S STAINLESS

Your Equipment

. . . AND COMPARE IT for lightness, strength and cost with U·S·S High Tensile Steel construction

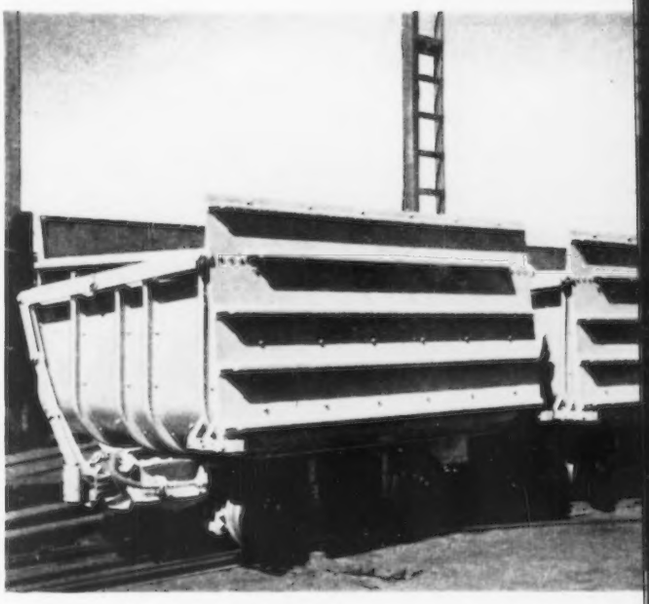
HERE'S a direct challenge to every user and builder of mobile equipment.

The safe reduction of deadweight with U·S·S High Tensile Steels—its resultant economies—its tangible returns in increased capacity and lower operating costs, are well-proved facts. You can't afford to overlook them.

Witness the typical applications illustrated. How does *your* equipment stack up? Is it still dragging around useless deadweight? Is it wearing out long before it should? Does it give you the capacity you have a right to expect? Rebuild it, *at low cost*, with service-tested U·S·S High Tensile Steels.

Both U·S·S COR-TEN and U·S·S MAN-TEN have yield points approximately 50% higher than structural quality open-hearth steel. Both are tough and hard wearing, highly resistant to shock and vibration—have 1/3 greater resistance to abrasion than mild steel. COR-TEN has unusually high resistance to atmospheric corrosion, 4 to 6 times that of plain steel. MAN-TEN equals copper steel in rust resistance.

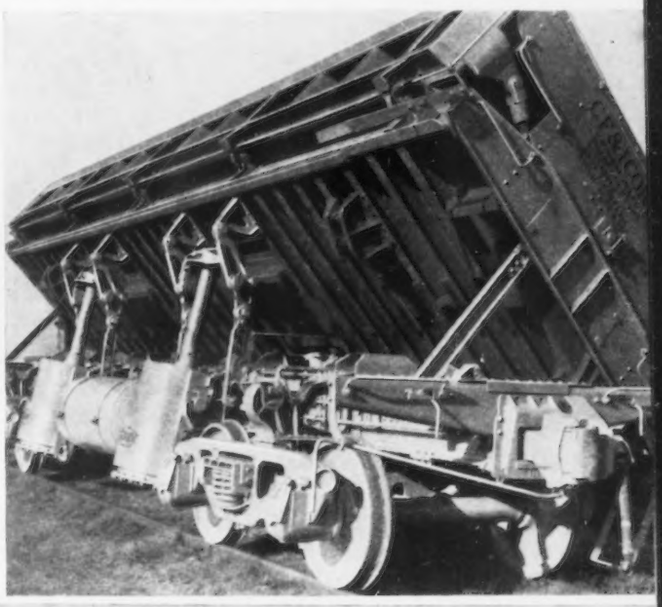
But because both these superior steels are *low* alloy steels—their price is low. Thousands of applications have proved they will reduce weight with little or no increase in cost. May we tell you more about them?



U·S·S MAN-TEN *mine cars weigh one ton less each.* In 200 of these Granby-type mine cars, MAN-TEN construction has reduced weight 2000 lbs. per car. Used with electric motor haulage, 45 cars to a train, this 45-ton weight reduction effectively reduces power consumption.

Welded U·S·S MAN-TEN *construction trims off 12,000 lbs. here.* Reduction of deadweight from 69,000 to 57,000 lbs. in this Austin-Western 30 cu. yd. railroad dump car substantially reduces motive power of hauling unit required.

A 6-car train of these lighter MAN-TEN-built cars actually weighs less than a train of 5 cars of the previous type.



AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
Scully Steel Products Company, Chicago, *Warehouse Distributors*
United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

WHY RESIST

the trend to WORTH?

With Worth Sheared Steel Plate quality is UP; physical and metallurgical characteristics always are UNVARYING . . . and Worth service is personal, prompt, entirely dependable.

Any Worth customer will verify this . . . or, see for yourself; send your next order to Worth!

WORTH

New York, N. Y.
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Pittsburgh, Pa.
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Hubbell & Sharp

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San Francisco, Calif.
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Houston, Texas
The Corbett-Wallace Corp.

Seattle, Wash.
National Steel Sales, Inc.

Los Angeles, Calif.
Ducommun Metals & Supply Co.

Cleveland, Ohio
E. F. Bond

Detroit, Mich.
H. L. Sevin

Portland, Oregon
National Steel Sales, Inc.

Montreal and Toronto, Canada
Drummond, McCall & Co., Ltd.

WORTH STEEL COMPANY
CLAYMONT, DELAWARE

the Threat to the Machine

THIS is the first of a series of six graphic presentations dealing with the improved machine as a builder of employment and of mass consuming power.

As these appear from month to month in THE IRON AGE, they will form irrefutable proof of the constructive, social and economic value of invention and improvement as expressed in the use of modern time-saving machines.

This first installment deals with the threat to progress involved in the widespread and alarming present day recurrence of the age-old antagonism to mechanical improvement.

By radio, motion picture and printing press, millions of Americans from pulpit,

MINNESOTA SENATE BILL No. 209, *introduced Jan. 23, 1939:*

"That no person, firm or corporation shall operate and maintain any labor-saving machinery or device without first obtaining from the Secretary of State a license to do so. . . . The license fee shall be $25 per year on each unit. . . . In addition, each such person, firm or corporation shall pay a tax on the use of such machinery of the sum of 25 per cent of the average wage of the person or persons replaced."

OSEPH O'MAHONEY, *Senator from Vyoming:*

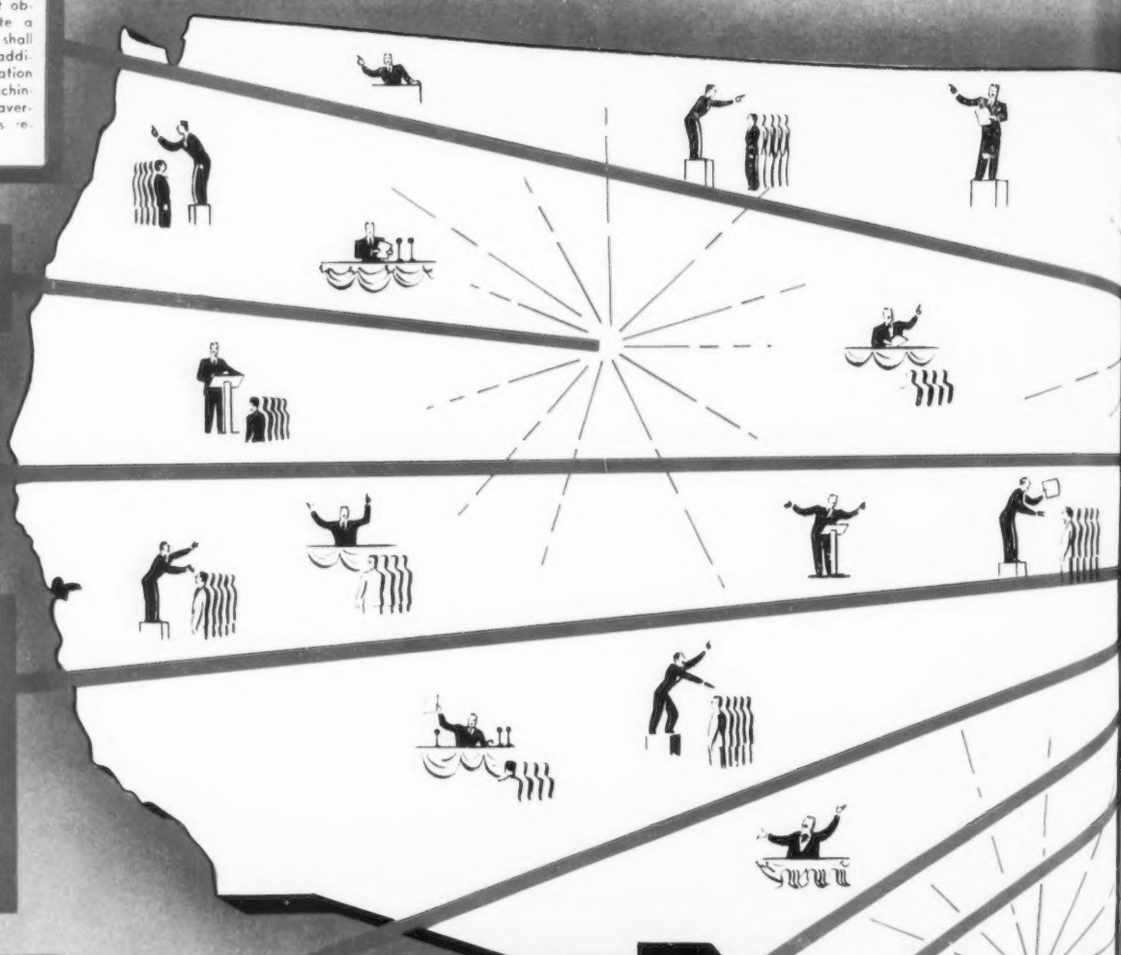
"Science and invention are to blame or the present unemployment in America."

NRY A. WALLACE, *at the Uni-rsity of North Carolina, May 24, 37:*

"It is possible to make the machine the vant of man and not the master. But going to be necessary to change many the Governmental rules of the game . . ."

MISSOURI HOUSE BILL No. 483, *in-troduced Feb. 28, 1939, Section 4:*

"The board is hereby authorized and empowered to investigate . . . the expense of operation of any employer in which any labor-saving device or apparatus is now in use . . . or which hereafter may be installed and which, in the opinion of the board decreases the cost of manufacture and the necessary number of employees . . . in which event the board shall enter a judgment and fix the amount of tax to be levied against such employer at not less than 25 per cent and not more than 50 per cent of the total cost of labor saved by the operation of such device . . ."



U. S. SENATE RESOLUTION S.J.3, *introduced by Senator Champ Clark, Jan. 4, 1939:*

"Resolved: . . . that the Secretary of the Treasury be authorized and directed to conduct an investigation as to the desirability and practicality of the imposition of a tax on the use of labor-saving and labor displacing machinery . . ."

ADOLPH J. SABATH, *Representative from Illinois, on the floor of the House of Representatives, Jan. 14, 1938:*

"The ever-increasing number of new labor-saving inventions in machinery has made a shorter working day absolutely necessary if anything near all our workers are to be employed."

HATTON W. SUMNERS, *Representative from Texas, on the floor of the House, Nov. 23, 1937:*

"There is not anything in the proposition that a labor-saving device puts more people to work. That is all hooey. . . . I am offering the bill to stop the issue of patents on the part of the federal Government in labor-saving devices."

HAROLD L. ICKES, *Town Hall of Washington, Jan. 26, 1938:*

"It is reasonable to suppose that, as time goes on, there will be more and more men unable to find employment for technological reasons."

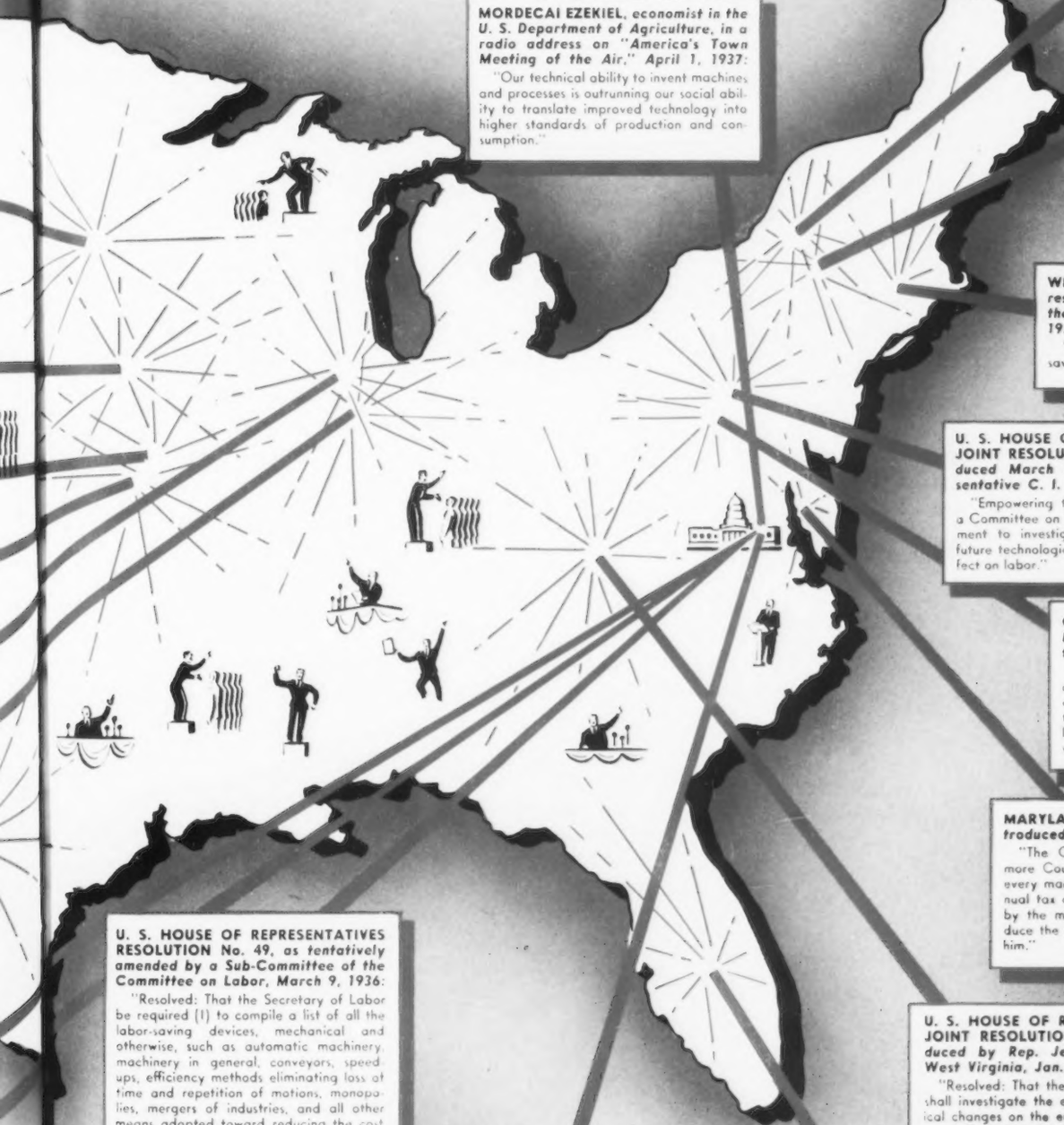
WILLIAM GREEN, *president, AFL, at the Black-Connery hearings, June 4, 1937:*

"Technology accounts for employment lagging behind production."

JOHN L. LEWIS, *CIO and UMW, at the Black-Connery hearings, June 7, 1937:*

"I know of nothing that is a greater burden on the mind of the employed worker and his family than constantly to be facing the possibility of dismissal from employment through the introduction of labor-saving devices."

anti-machine propaganda is carried to platform and legislative halls from coast to coast.



MORDECAI EZEKIEL, *economist in the U. S. Department of Agriculture, in a radio address on "America's Town Meeting of the Air," April 1, 1937:*

"Our technical ability to invent machines and processes is outrunning our social ability to translate improved technology into higher standards of production and consumption."

JAMES M. MEAD, *Senator from New York, on the floor of the House of Representatives, June 24, 1936:*

"The biggest problem in the world today—unemployment. The cause of the problem is technological."

WILLIAM O. DOUGLAS, *former Chairman SEC (now Supreme Court Justice):*

"Over the years we have been preoccupied with materialistic and mechanical matters. The main current of our modern times has been a sweeping advance of technology and too often it has overshadowed all else."

WILLIAM P. CONNERY, JR., *late Representative from Massachusetts, at the Black-Connery hearing, June, 1937:*

"I have always believed that . . . labor-saving devices . . . should be taxed . . ."

U. S. HOUSE OF REPRESENTATIVES JOINT RESOLUTION H.J. 245, *introduced March 28, 1939, by Representative C. I. Faddis:*

"Empowering the President to appoint a Committee on Technological Unemployment to investigate, past, present and future technological changes and their effect on labor."

GEORGE H. EARLE, *Ex-Governor of Pennsylvania, at the Byrnes Committee hearing:*

". . . persons past 40 or 45 find it difficult or impossible to obtain jobs. . . . An outstanding reason, certainly, would seem to be the development of inventions and labor-saving techniques which replace men with machines."

MARYLAND HOUSE BILL No. 208, *introduced Feb. 9, 1939:*

"The County Commissioners of Baltimore County shall levy and collect from every manufacturer and processor an annual tax on the use of any machine used by the manufacturer or processor to reduce the number of persons employed by him."

U. S. HOUSE OF REPRESENTATIVES RESOLUTION No. 49, *as tentatively amended by a Sub-Committee of the Committee on Labor, March 9, 1936:*

"Resolved: That the Secretary of Labor be required (1) to compile a list of all the labor-saving devices, mechanical and otherwise, such as automatic machinery, machinery in general, conveyors, speed-ups, efficiency methods eliminating loss of time and repetition of motions, monopolies, mergers of industries, and all other means adopted toward reducing the cost of production . . . after Dec. 21, 1920, which are still in use and are being constantly improved; (2) to estimate the number of persons in the United States unemployed at the time of completion of such a list by reason of the use of each kind or type of such devices or methods in each of the various divisions of industry, commerce and agriculture; and (3) to report the findings in the House of Representatives together with such observations and recommendations as the Secretary deems pertinent and useful. Every officer or employee of the United States shall be required to cooperate and to supply the Secretary with such information relating to any matter under investigation as the Secretary may request. Such a list of labor-saving devices are to be kept up to date from year to year, with such additions as may be dictated by progress and changes in industry, commerce, and agriculture."

U. S. HOUSE OF REPRESENTATIVES JOINT RESOLUTION H.J. 31, *introduced by Rep. Jennings Randolph, West Virginia, Jan. 3, 1939:*

"Resolved: That the Secretary of Labor shall investigate the effects of technological changes on the employment of labor . . . shall conduct detailed studies of recent labor-saving devices .... etc., etc."

BARNARD BARUCH, *before the Byrnes Committee hearing, Feb. 28, 1938:*

"That there has been a vast replacement of men by machines is beyond argument. . . . I suggest that the whole social security set-up be restudied and that a tax on machine-hours or even on gross sales, rather than payrolls would be more logical. . . ."

CLAUDE PEPPER, *Senator from Florida, in radio address, March 7, 1938:*

"The truth is that ever since machinery has come to be the real producing agency of the world, we have had economic maladjustment."

THUS far in our history there has been no restriction upon American industry in the use of improved machinery. And that is one reason why today the standard of living of an American who is dependent upon relief is higher than the standard of living of a skilled mechanic under either Hitler or Stalin.

But do not be too sure that you will always have this privilege of employing improved machinery.

Twenty million Americans have reached employment age since 1930, and have, therefore, never experienced what we older people believe to be prosperous or even normal times. Of that number, even those who have been able to secure work have existed in the daily fear of losing their jobs.

This "lost generation" is the one that will rule America ten years from now. What is this generation hearing from prominent public people as to the reason for the uncertainties and the anxiety which it has experienced?

It hears Senator Joseph O'Mahoney, for example, say "science and inventions are to blame for the present unemployment in America." It hears ex-Governor George H. Earle, Secretary Harry Hopkins, Secretary Harold Ickes, Senator Claude Pepper, Representative Hatton W. Sumners and dozens of other prominent figures in public life condemn the machine and technological progress as responsible for the difficulties and misfortunes encountered by this "lost generation."

Is it any wonder then that this feeling, so ably promoted, becomes interpreted in legislation? Take, for example, Missouri House Bill No. 483, introduced Feb. 28, 1939, which authorizes the investigation of the expense of operation of any employer in which any labor saving device is now in use . . . or which hereafter may be installed. And which permits an administrative board to enter judgment and fix a tax varying from 25 to 50 per cent of the total cost of labor saved by the operation of such device.

And Maryland House Bill, No. 208, which authorizes the County Commissioners of Baltimore County to levy and collect an annual tax on the use of any machine which reduces the number of persons employed.

And again, Minnesota Senate Bill, No. 209, which requires the obtaining of a license from the Secretary of State be-

FEAR of the machine and efforts to prevent the use of improved machinery antedate even the invention of the steam engine. In the year 1661, a loom was set up in Danzig which could weave from four to six webs at a time without human aid. In order to prevent this machine from injuring the poor people, the authorities suppressed it and drowned the inventor.

The word sabotage, which means the intentional harming of machinery or slowing down of production, is derived from the French "sabot", meaning wooden shoe. In Belgium, when power weaving machinery was introduced, the workers threw their wooden shoes into the apparatus to damage it and stop its operation. Hence the word "sabotage".

In the first number of THE IRON AGE, published in 1855, there was a serious discussion of whether there would be much opportunity for further im-

provement in a world already so perfected. This was before the invention of the Bessemer converter, which was the starting point of the steel industry. And shortly after the Civil War one of our Commissioners of Patents stated that there was little use of continuing the Patent Office since most everything worth while had already been invented.

Apparently machinery has been a traditional "goat" for the ills of mankind, however incurred. For the Encyclopedia Britannica tells us that in the early days of the power loom, workers destroyed the machinery, burned the mills and "blamed the power loom for the distress occasioned by war and political disturbances".

It is an interesting speculation as to whether we would be better off today, had these early advocates of improvement-prevention and machine-restriction had their way.

fore any person, firm, or corporation can have or maintain any labor saving machinery or device. In addition, it imposes upon such individual, firm or corporation a tax equal to 25 per cent of the average wage of the person or persons replaced.

A resolution introduced by Senator Champ Clark on Jan. 4, 1939, directs the Secretary of the Treasury to conduct an investigation as to the desirability and practicality of the imposition of a tax on the use of labor saving machinery. Senator Clark, as you know, is a conservative Democrat, not a "New Dealer."

At least a half dozen United States congressmen are also known to be working on bills to restrict machinery which will be introduced in the coming months. Some would levy a tax in proportion to horsepower or production, the proceeds of which would be used for old age pensions or unemployment relief. Some would have the Federal Government cease to grant patents on inventions which might be construed as labor saving. There is already a broad policy of curbing the flow of investment funds into industrial equipment, based on the theory that unemployment follows and is caused by purchases of capital goods.

If you will obtain a copy of House of Representatives Resolution No. 49, I think you will have some interesting and significant reading that will open your eyes as to the attitude of our Federal law-makers toward improved machinery. Suffice it to say, that this resolution empowers and orders the Secretary of Labor to compile a list of all of the labor saving devices, mechanical and otherwise, which have been put in operation in the U. S. after Dec. 31, 1920. It requires this department to estimate the number of persons in the United States unemployed at the time of completion of such a list by reason of the use of each kind or type of such devices or methods in each of the various divisions of industry, commerce, and agriculture in the U. S.

Accompanying this resolution is a form to be filled out by users of such machinery for each machine thus employed. A form which is more formidable than your income tax blank and which would require you to list every machine in your plant from a drill press to a continuous rolling mill, and the complete case history of each such mechanism. The number and kind of operations which it has performed.

Before time-saving machines created modern threshing equipment.

Before time-saving machines created the elevator.

Before time-saving machines created modern material handling.

Before time-saving machines created modern building materials.

Their cost. The wages paid to the operators on such operations, either piece work or day work. And so on, *ad infinitum*.

These rapidly growing indications of legislative intent to put the machine on trial and to restrict its liberty if adjudged guilty cannot be dismissed lightly. It is not a matter of "New Deal" philosophy, since the participants in this questioning of technology include conservative Democrats, who are opposed to the New Deal, as well as Republicans. Indeed, politics does not enter into this question. It is a matter of economics and those who advocate the slowing down of the machine are sincere in their belief that such action would benefit the majority of our citizens.

Take, for example, the views of Congressman Charles I. Faddis, of Pennsylvania, as expressed in the Congressional Record of March 29, 1939, extracts of whose remarks are quoted below:

"I am not one of those who wishes to be marked down as being opposed to progress, for I know the benefits that machinery has brought to mankind * * * but I believe that for the past 15 years we have been becoming more and more supersaturated with machinery. Food is improved by a certain amount of salt; more salt makes it unpalatable and still more makes it absolutely inedible.

"If you will take almost any industry of this nation you will find that great inroads among the laborers have been made by machinery. Of course, I realize that there are machines which have been labor creating, such as the automobile, the radio and various others. I realize also that there are certain types of machinery which prevent men from being put at hard and dangerous toil and these are justified. * * * In a great many instances, machinery has been installed *merely to displace men in the interest of time*. The result is unemployment, poverty, distress and labor disturbance.

"It is all very well to attempt to solve this problem by resorting to theoretical answers and trick figures to show that machinery is creating more jobs than it is displacing workers. Such an answer may satisfy those who prefer not to think the matter through. We have our mass of unemployed, which is constantly increasing. It is time we ceased to be lulled into a false sense of security in regard to this matter by the sedative of theory."

The view that machinery should bear a special tax to provide funds for unemployment relief is by no means confined to a few legislators. Note this from the top ranks of business—Bernard Baruch:

THE illustrations on these pages show how we Americans might be spending our working hours today if the advocates of restricting or preventing improvement had succeeded a century ago.

There would probably be no discussion of a 30-hr. working week today, under such circumstances, since it took from 60 to 70 hr. a week to earn a living in the pre-mechanized era.

"That there has been a vast replacement of men by machines is beyond argument . . . I suggest that the whole social security set-up be restudied and that a tax on machine-hours or even on gross sales, rather than on payrolls would be more logical . . ."

A few days ago a building contractor in a small New York town expressed the belief that machinery should be put on a 40-hr. week and taxed. At least 25 newspapers carried the story.

Some of the most powerful brakes on the wheels of mechanical progress are not applied directly to curb technological advance. Laws are passed and others are proposed to solve real or imagined problems, and a by-product of them is stifled mechanical progress.

Basically, most of the proposals for "social legislation" affecting machinery installation and use have to do with national planning—new government control over vast economic and social areas. Policies now in effect or frequently proposed which are threatening technological advance are in general as follows:

1. The patent system is under attack for its alleged contribution to anti-social monopoly. Disturbance of the basic principles of American patent laws opens the door to the use of patent grants for punitive purposes, and to countless other conditions which might not only discourage but prevent technological advance.

2. Federal control of wages, hours and working conditions is predicated largely on the theory that government intervention is necessary to adjust dislocations resulting from technological advance. Public acceptance of this principle is a tacit acceptance of the converse application of it—government control of technological change for the purpose of improving wage, hour and working conditions.

3. Tax policies and legislation affecting investment are already curbing technological advance by decreasing the funds available for research, experimentation and development of new products and industries. The ostensible purposes are to limit alleged excessive plant expansion, excessive profits, which prevent proper distribution of national income, and excessive speculation, which leads to economic and social losses.

4. Corporation licensing by the Federal Government is advanced ostensibly to curb monopoly and to prevent other possible social abuses. This power over corporations, accompanied by other regulations already granted and proposed, leaves the way open to complete dictation as to plant expansions, equipment replacement, expenditures for prod-

The tax problem would be more acute than ever, since there would be no large corporations with taxable profits. Hence we would have either to drastically cut Government costs or "soak" the little fellow.

Of course, there would be no automobiles, radios, moving pictures, electric refrigerators or washing machines, except for those few able to afford "hand made" luxuries.

Before time-saving machines created modern pumping systems.

Before time-saving machines created modern mining methods.

Before time-saving machines created modern road building.

Before time-saving machines created the modern laundry.

uct development and new inventions, which would put control of technological change in the hands of government.

5. The belief that owners enjoy disproportionate benefits from machinery use has led to a wide variety of proposals for special taxes on machinery to raise funds to relieve unemployment. These proposals involve levies on horsepower, dollar investment, hours of use, and the like.

We are living in a "machine age." And if we are to live in a machine age comfortably and happily, we must understand the machine and what it means to living. We must recognize its faults and appreciate its virtues. There is nothing to be gained by throwing mud at it or spreading the whitewash.

Those who accuse the machine of causing unemployment and distress deserve to be answered logically and with convincing evidence to the contrary by those who believe that the machine creates enlarged employment and increased mass consuming power.

Any such answer, to be effective, must strictly avoid what Mr. Faddis calls "resorting to theoretical answers and trick figures to show that machinery is creating more jobs than it is displacing workers." Such an answer must decisively refute the claim that the use of "time-saving" machinery is

concentrating wealth and spreading poverty. It must also explain why there are 10 million unemployed in our highly mechanized United States, if technology does not create unemployment.

Having presented, in this issue, the background of the threat to the machine embodied in legislative thinking, THE IRON AGE will present, from month to month, the case for the defense. We shall endeavor to prove conclusively that "time saving" improvements in mechanization have been and still are the most powerful forces for enlarged employment and increased mass purchasing power that we have available in a modern economy. And that to handicap, restrict or penalize the use of such improvements would be to vastly increase poverty and unemployment.

The next installment of this presentation will appear in THE IRON AGE of June 8.

Illustrations by Harry Johnson

YOU

can help defend the machine!

To assist in promoting the widest possible reading of Mr. J. H. Van Deventer's "THREAT TO THE MACHINE" series, reprints of the preceding 8-page editorial article are available at the following prices:

100 reprints - - -	$5.00
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Please order reprints at once as the above prices are good only until May 26. Number 2 of the series will be published June 8. Advance orders for June 8 reprints accepted now.

THE IRON AGE

A Chilton Publication

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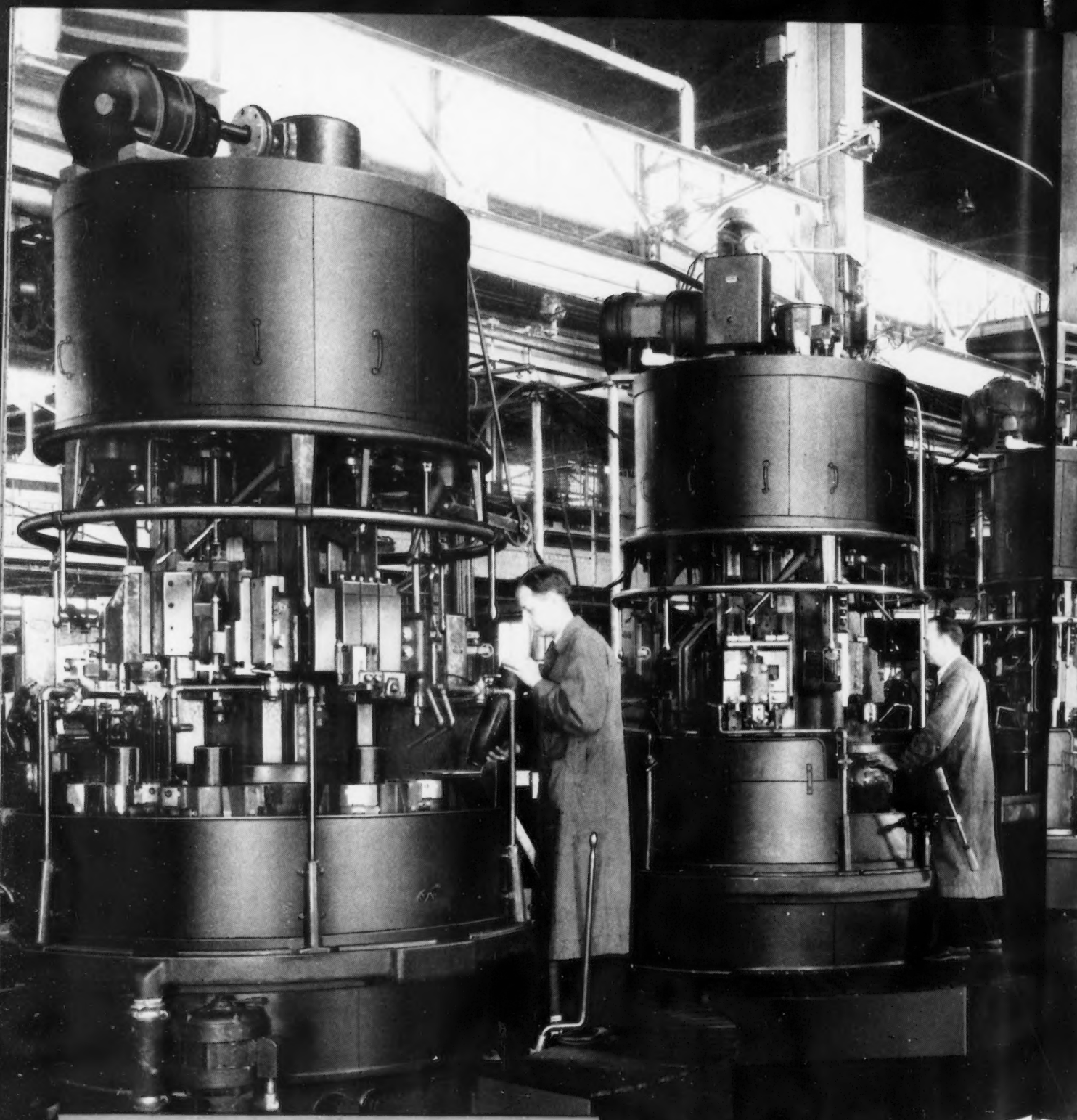
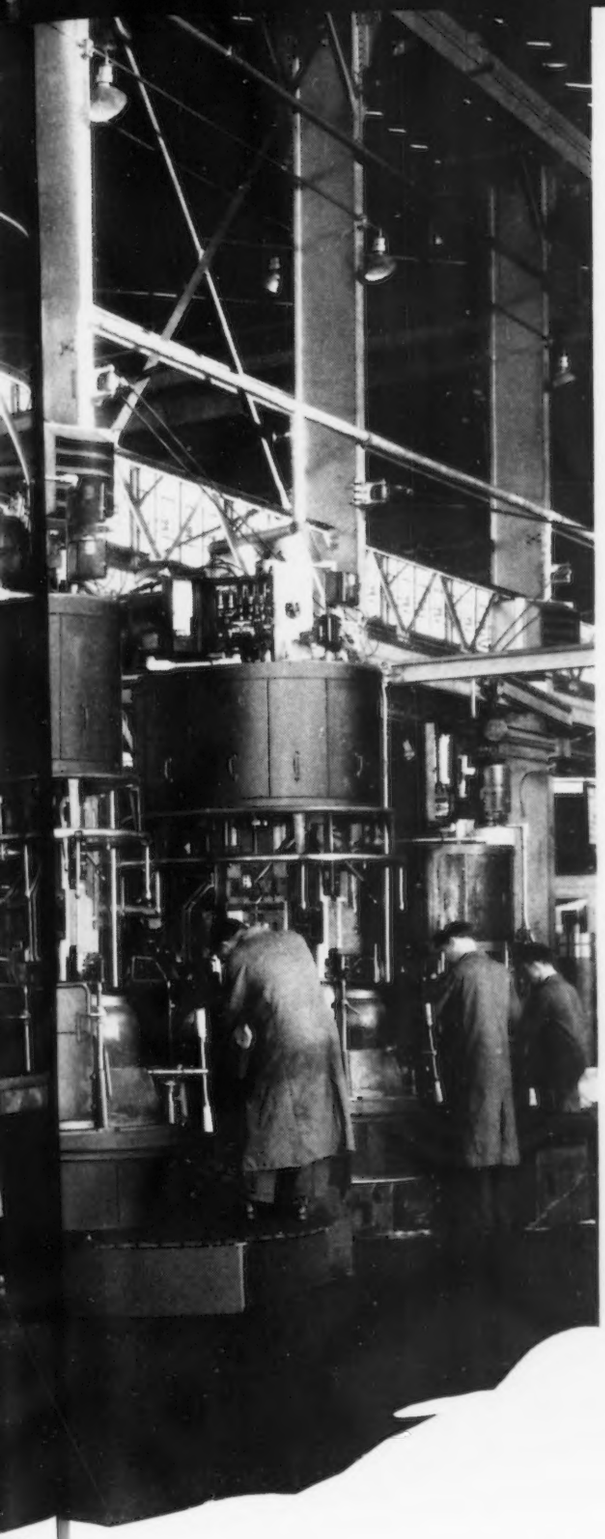


MEN AT WORK

Bullard Mult-Au-Matics at work mean *men* at work—not merely the men on the machines, but men in foundries, forge shops, and tool rooms. Jobs all along the line. Hundreds have jobs because Bullard Mult-Au-Matics have reduced manufacturing costs which end up in lower selling prices and greater sales to more people.



A battery of Bullard Mult-Au-Matics. Each machine has eight stations. Individual speeds and feeds all working at once, with the result that floor to floor time is a fraction of that required by any other method.

MULT-AU-MATICS CAN HANDLE SHORT RUNS AUTOMATICALLY. READ THIS!

Machine tool builders have short runs—particularly builders of big machines as Bullards are. *Yet in our own plant we keep several Mult-Au-Matics almost continuously at work on parts for our own products.*

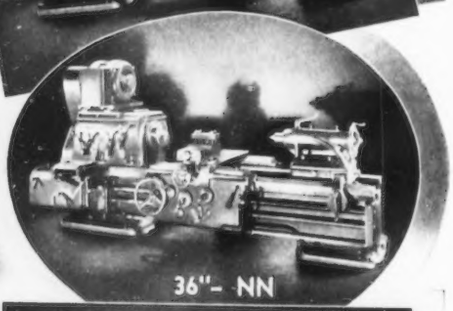
This is both possible and profitable because Mult-Au-Matics are versatile and can be set up and retooled far more rapidly than you would think possible. To manufacturers who may not have realized this angle, we say: "Let a Bullard Engineer make an analysis of your jobs. If there are only minor savings to be made, he will tell you. If real savings are possible, you will want to know it."

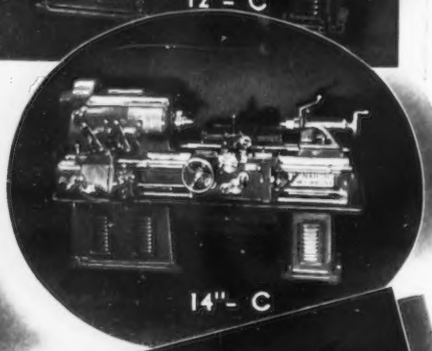
THE BULLARD COMPANY
Bridgeport, Connecticut

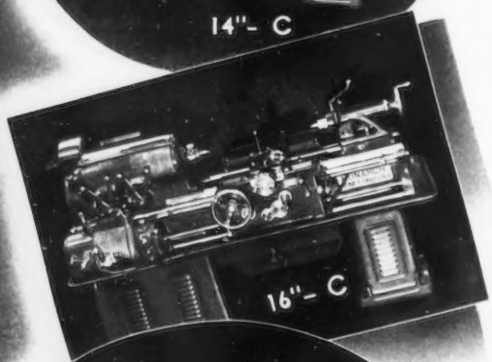
Bullard Machines are bought because engineering studies conclusively prove their purchase to be a profitable investment. But in the larger sense, each Bullard at work does far more than make money for its owner—It makes jobs for *men*.

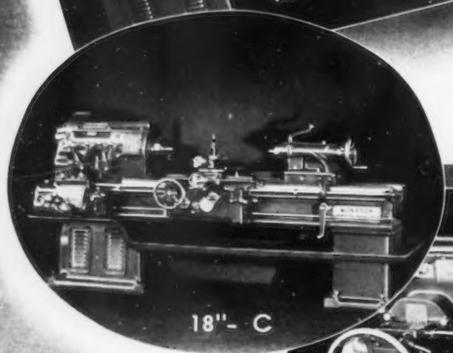
BULLARD

THE MONARCH LINE OF LATHES COVERS THE TURNING FIELD









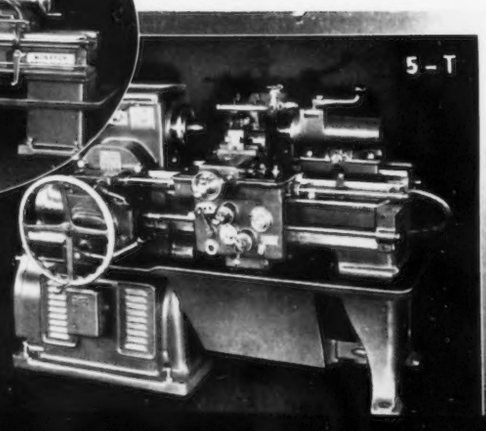
THERE is no such phrase as "can't be done" in the Monarch dictionary. Never was this fact more apparent than in the vast array of improvements already completed. Big, new catalogs, packed with illustrations and facts on the new Monarch features, greatly improved and expanded production as well as testing facilities, and full coverage of all lathe sizes from 10" to 36"—these and many other new factors point more definitely than ever before to Monarch as the key to lathe modernization plans.

Outstanding Features Like These Characterize All Monarch Lathes . . .

With each passing year, Monarch engineers have created many new features and advantages, most of them exclusive with Monarch. They speeded up operation, reduced costs, simplified jobs, and met the increasingly high standards, constantly being set by industry today.

1. All steel parts including headstock spindle, tailstock spindle, all shafts, gears, clutches, and operating parts in headstock, end gear train, quick-change gear box, and apron, including bed rack **are made of nickel alloy steel, electric furnace hardened.**
2. All headstock gears have tooth contours ground on P. & W. gear grinders, to a tolerance of .0002".
3. Headstock provides sixteen quickly secured mechanical spindle speed changes covering a wide range.
4. All headstock gears are helical, quiet, smooth, and powerful, and never transmit gear tooth marks.
5. Anti-friction bearings used throughout Monarch lathes to reduce friction, and prolong accuracy.
6. The hardened cam-lock spindle nose, the quickest known means for the rigid and accurate mounting of chucks, plates, and fixtures.
7. Alloy steel hardened and graduated oversize tailstock spindle.
8. Automatic force feed lubrication to bed ways, carriage, apron, compound rest, with the Monarch Duprene way protectors.
9. Large diameter direct reading compound rest and cross feed dials.
10. Six distinct sizes of precision tool room lathes distinctly different in design from the engine lathe, and combining "built-in-lead-screw reversing mechanism," together with many features making them outstanding for precision tool room work.
11. Special Alloy castings, many of which are made of Meehenaite, for all important units such as bed, carriage, compound rest, headstock, taper attachment, and many other parts.
12. All handles, hand wheels and operating levers are chromium plated to prevent rusting or tarnishing.
13. Convenient leveling screws in all legs, provide the best and most convenient means of preserving and maintaining accurate installation.
14. Monarch alloy cast FLAME HARDENED and precision ground lathe bed ways eliminate bed wear and scoring and preserve accuracy.

And many other outstanding design, material and construction features that reflect Monarch lathe leadership.



Modernize with Monarch!

...and here are some of the Monarch Lathes accessories

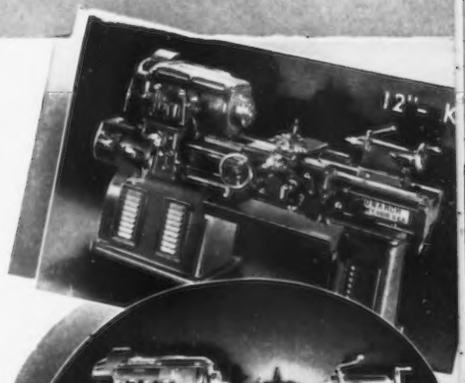
Production men and executives, concerned with lathe operation, have welcomed the presentation of each new Monarch development with enthusiasm, because experience has shown them that each of these new Monarch accessories has been specially designed to solve certain specific turning problems. Two-fisted production executives will recognize immediately the advantages made possible by the many new Monarch features, a few of which include:

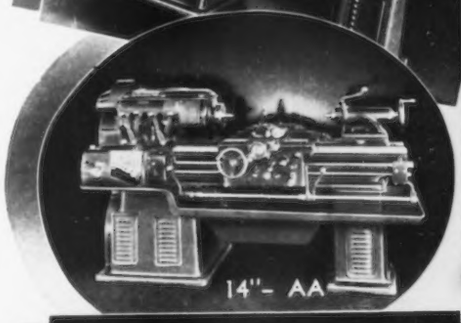
1. The anti-friction bearing taper attachment, which with the taper attachment variator, provides maximum tapers to 94 degree included angle, and length turning taper capacity at one setting the maximum length the lathe accepts between centers. Also provides facilities for contour turning and boring from a master template.
2. Micro-gauging dials of great assistance to the operator in accurate and quick diameter setting of tools.
3. Built-in anti-friction bearing tailstock centers for modern high speed turning.
4. Large capacity oil and chip pan.
5. Power angular feed tool slide, single and double, for angular turning and facing.
6. All types of tool rests to increase production and reduce cost.
7. All types of work supporting rests including the anti-friction bearing types.
8. All types of single and multiple length and diameter feed stops.
9. Keller electric controls, on all sizes of lathes, for all types of irregular contour turning and boring.
10. Cam milling attachments on the Keller controlled lathes for milling irregular contour shapes.
11. The Centrode Devices for turning and boring shapes other than round.
12. Oval Chucks for oval turning and boring.
13. All types of turrets for carriage and bed to broaden the scope of lathe work.
14. Relieving attachments as well as all accessories for precision tool room work.
15. The multi-speed drive for certain sizes of lathes. Any desired surface cutting speed, on all diameters, is automatically maintained.
16. AUTOMATIC SIZING as applied to all sizes of Monarch engine lathes and tool room lathes makes the lathe an automatic machine for small or large lot production.

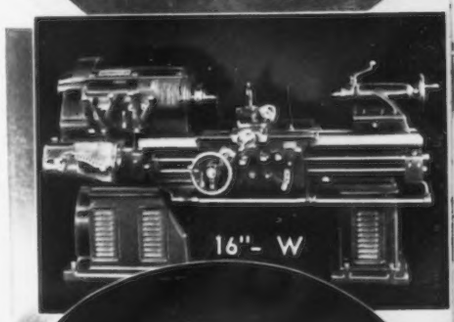
THE MONARCH MACHINE TOOL CO., Sidney, Ohio, U. S. A.

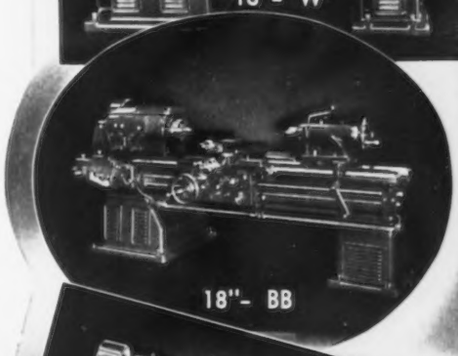
MONARCH LATHES
COVER THE TURNING FIELD
SIDNEY, OHIO, U.S.A.

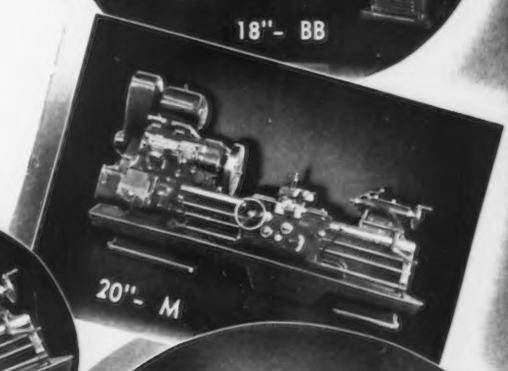
Newark Sales Office: 1060 Broad St. ● Pittsburgh Sales Office: 604 Chamber of Commerce Bldg. ● Chicago Sales Office: 622 W. Washington Blvd. ● Indianapolis Sales Office: 3115 North Meridian St.
Agencies in principal industrial centers of this and foreign countries.

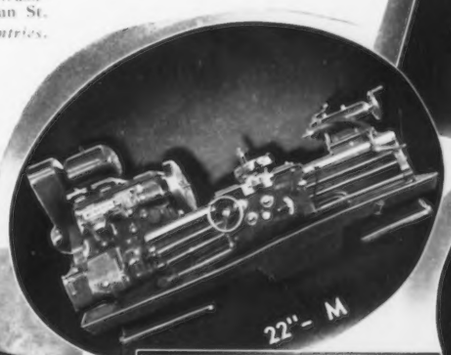


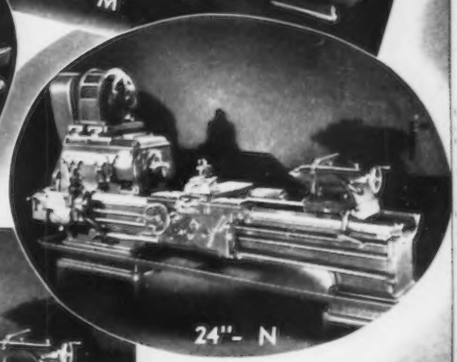


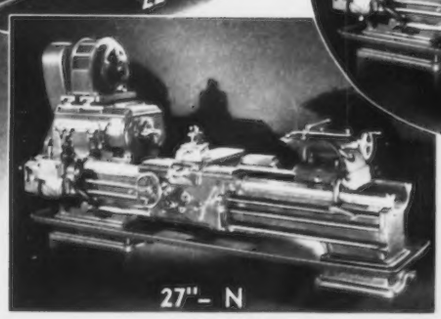








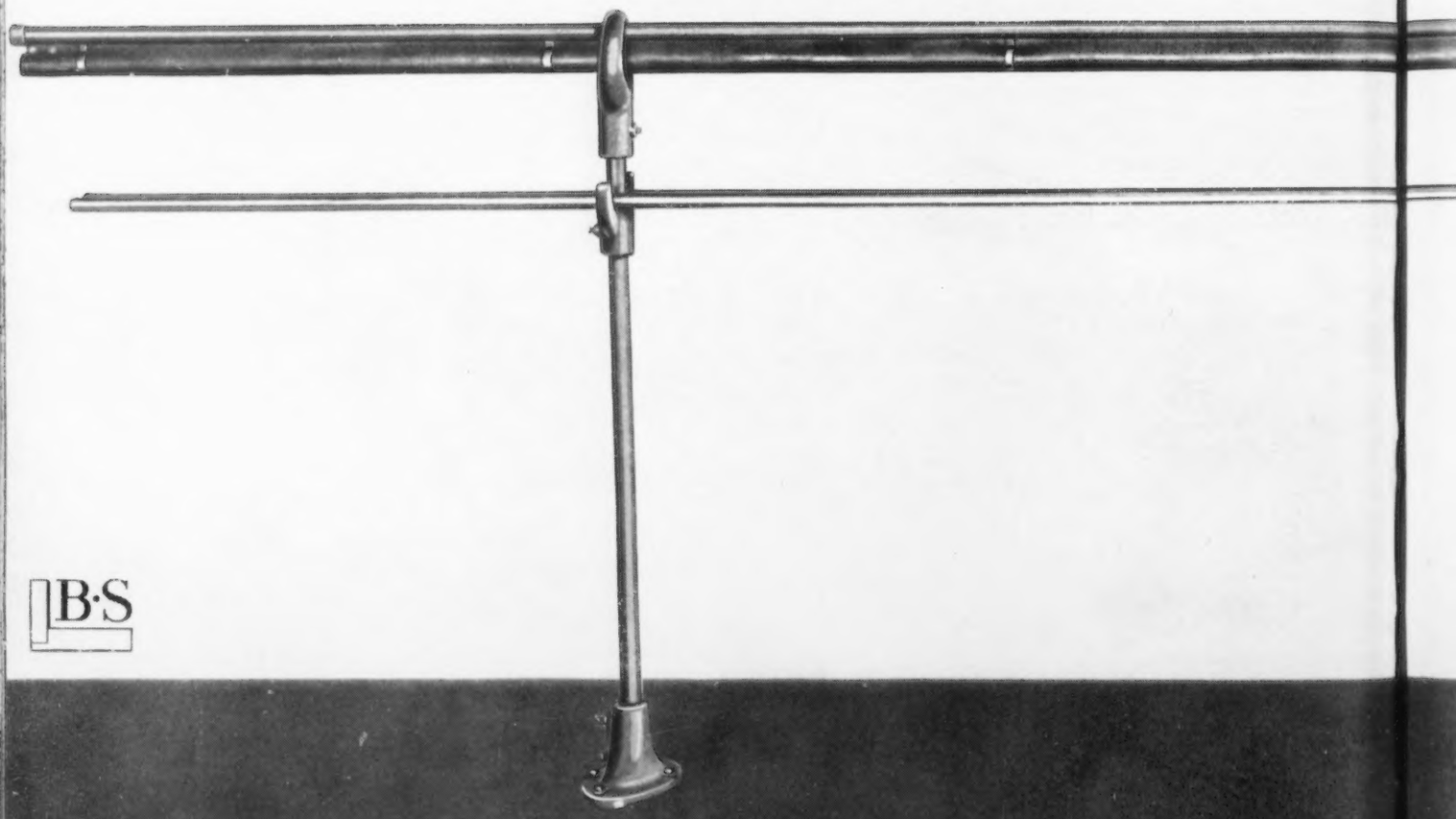




Modernize with Monarch!

MODERN WIRE FEEDS
Profitable — for Short Runs

Quickly set up—Simple to operate—Minimum number of controls—Sturdy—Amply and efficiently powered



B·S

No 0

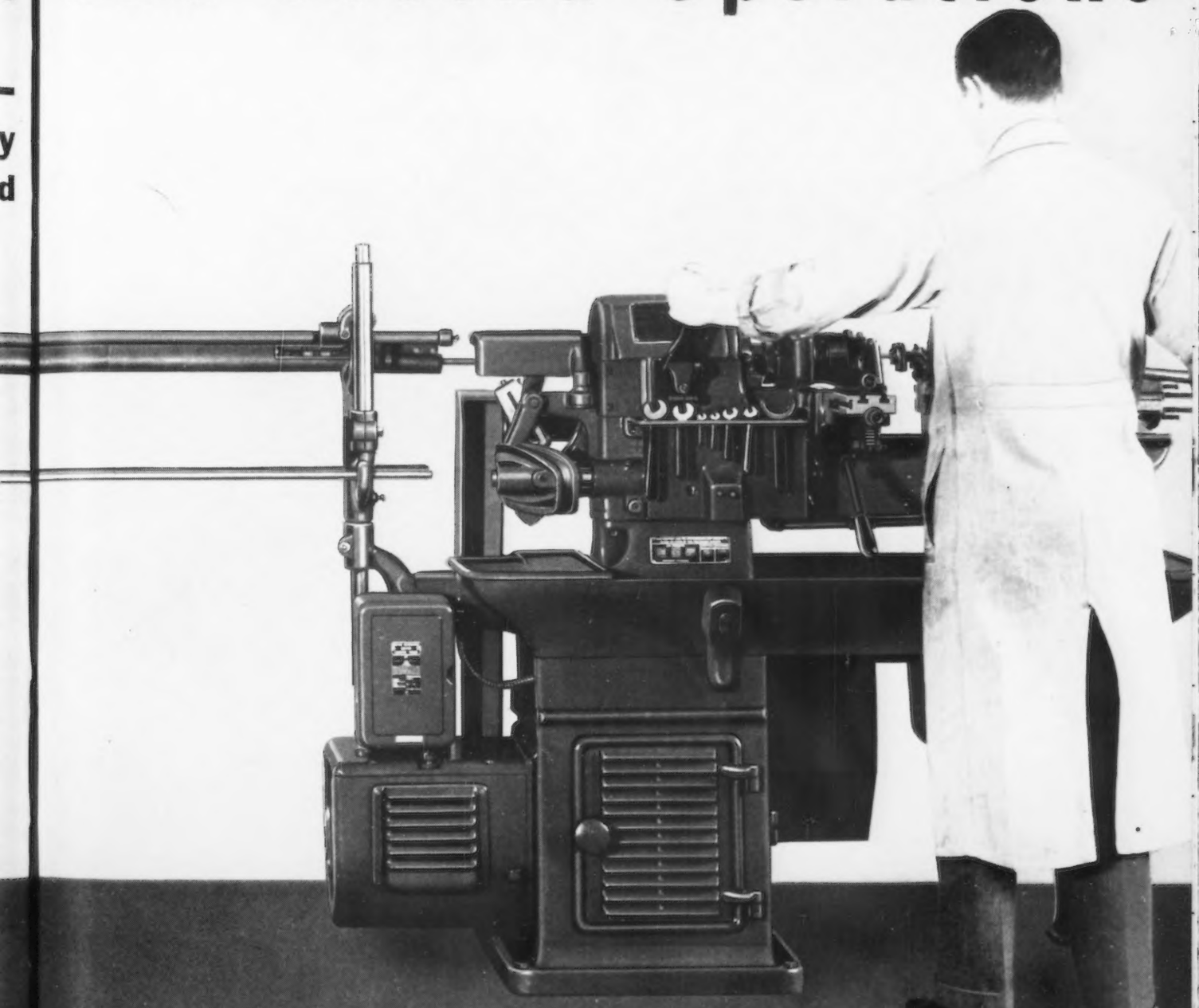
Hole through largest regular feeding finger	3/8"
Turns any length to	2¼"
Greatest distance, turret to front of chuck	7"
Motor or Overhead Drive	

No 1

Hole through largest regular feeding finger	5/8"
Turns any length to	4"
Greatest distance, turret to front of chuck	12½"
Motor or Overhead Drive	

BROWN &

SCREW MACHINES....
and Second Operations

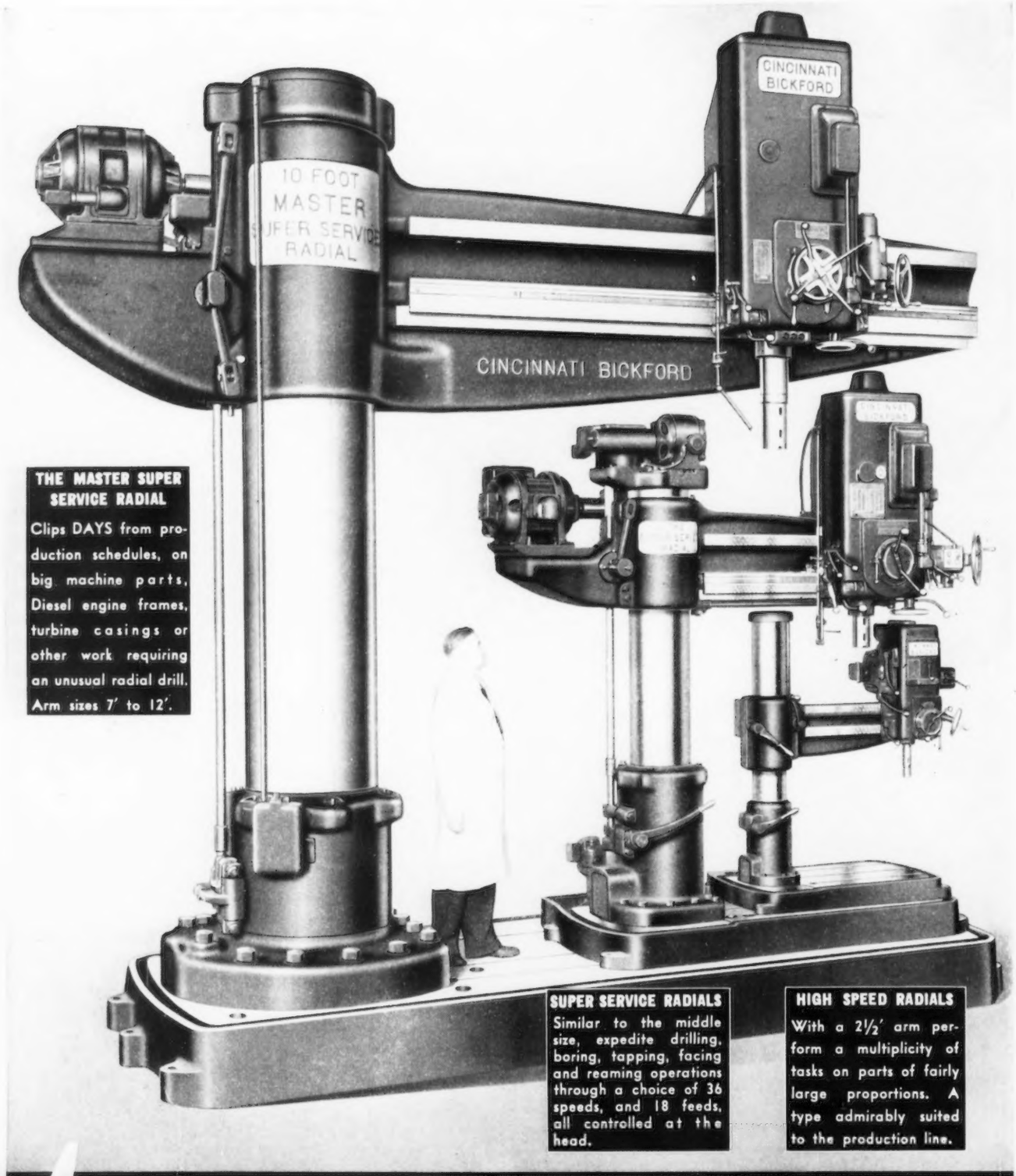


No 2

Hole through largest regular feeding finger..... 1″
Turns any length to..... 6″
Greatest distance, turret to front of chuck..... 18″
Motor or Overhead Drive

Details on request.
Brown & Sharpe Mfg. Co.
Providence, R. I., U. S. A.

SHARPE



THE MASTER SUPER SERVICE RADIAL

Clips DAYS from production schedules, on big machine parts, Diesel engine frames, turbine casings or other work requiring an unusual radial drill. Arm sizes 7′ to 12′.

SUPER SERVICE RADIALS

Similar to the middle size, expedite drilling, boring, tapping, facing and reaming operations through a choice of 36 speeds, and 18 feeds, all controlled at the head.

HIGH SPEED RADIALS

With a 2½′ arm perform a multiplicity of tasks on parts of fairly large proportions. A type admirably suited to the production line.

A VERY LARGE.. and helpful.. FAMILY

Cincinnati Bickford's family portrait of three generic sizes illustrates the range of help afforded on drilling problems. The family includes many sizes of the Super-Service Radial Drill and a complete line of Upright Drills, all endowed with distinctive time-saving features.

THE CINCINNATI BICKFORD TOOL CO.

OAKLEY, CINCINNATI, OHIO

MORE THAN 41 Years OF DOING ONE THING WELL

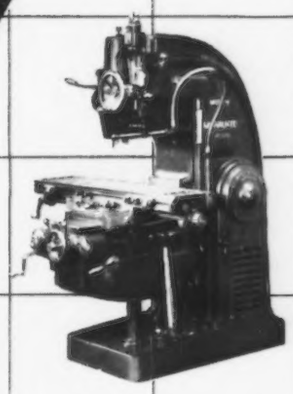
1899
12 EMPLOYEES

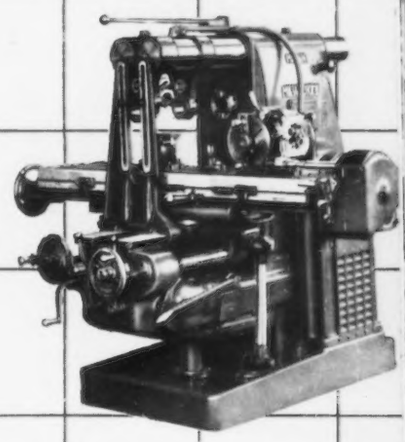
1909
151 EMPLOYEES

1919
653 EMPLOYEES

1929
904 EMPLOYEES

1939
1352 EMPLOYEES





Early in its business life, Kearney & Trecker Corporation included among its products lathes, boring bars, grinders, special machine tools, etc., . . . but soon discovered that if they were to excel, it would be necessary to concentrate their efforts upon one product. The soundness of this policy has been demonstrated.

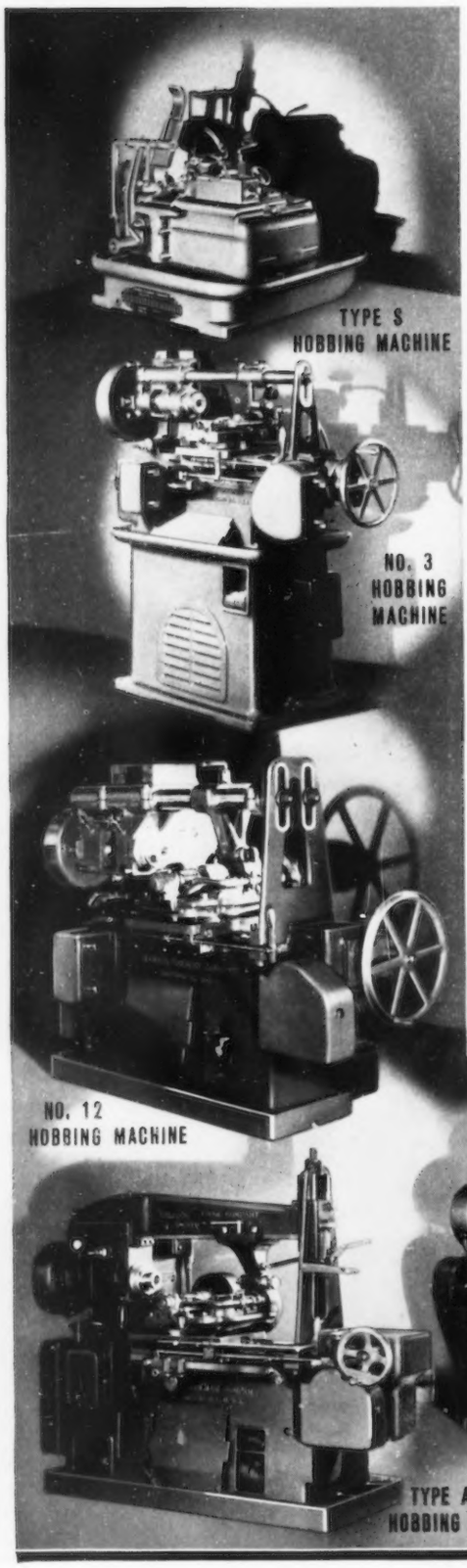
KEARNEY & TRECKER CORPORATION
MILWAUKEE, WIS., U. S. A.

MORE THAN 41 years OF DOING ONE THING WELL

K&T

Milwaukee **MILLING MACHINES**

For Production Achievement



Barber-Colman Offers

A Complete Hobbing Service—

MACHINES—Six standard sizes and types ranging in capacity from 1" diameter by ½" face to 12" diameter by 12" face. Special machines built to order.

HOBS—Ground hobs for highest accuracy, production, value. Unground hobs for ordinary commercial accuracy, lowest first cost.

HOB SHARPENING MACHINES—Made in 2 sizes, both automatic. Grind accurately any make of straight- or helical-gashed hob with radial tooth-faces equally spaced.

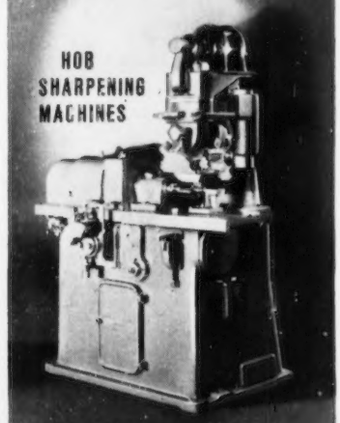
SERVICES—Expert specialists for consultation on your hobbing problems, trained operators to demonstrate Barber-Colman Hobbing Machine installations and inspect them for you periodically thereafter.

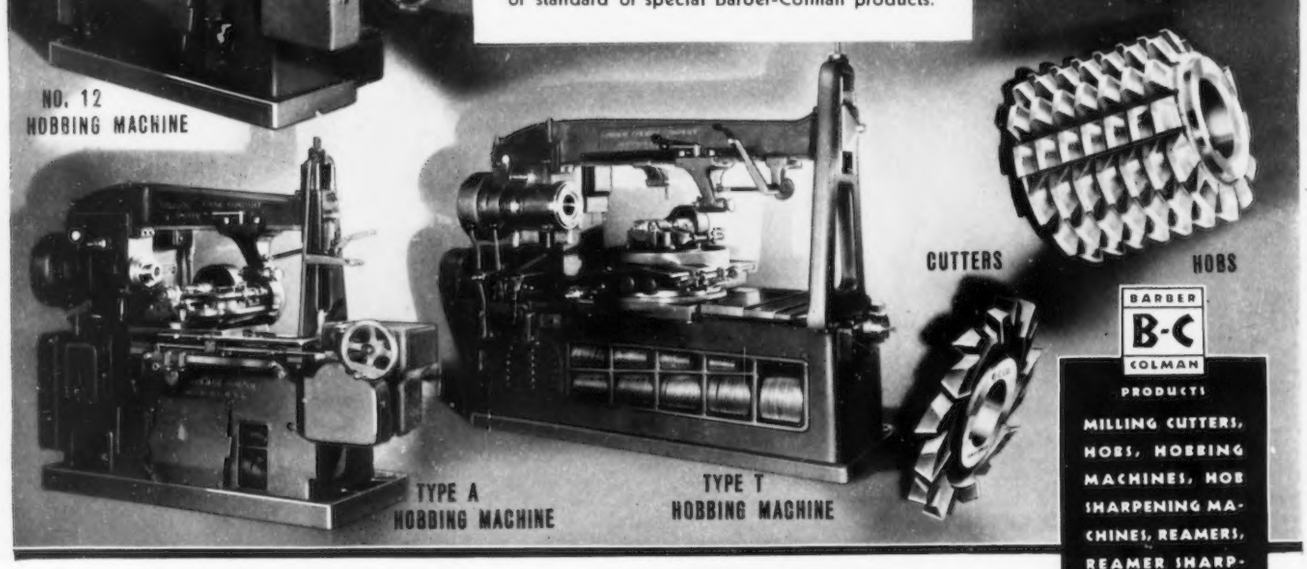
Milling Cutters—Back of Barber-Colman Cutters are the same experience and facilities that have made Barber-Colman Hobs pre-eminent. Skillful cutter designers are available for cooperation in solving cutter problems.

Reamers—Barber-Colman Reamers are distinctive in design, highly successful in operation. Their cutting edges are finished on the Barber-Colman Reamer Sharpening Machine—an exclusive feature which has many advantages.

Reamer Sharpening Machines—The Reamer Sharpening Machine creates the unique cutting edge and extremely high accuracy which distinguish Barber-Colman Reamers, recreates these qualities when purchased for servicing Barber-Colman Reamers used in high-production manufacturing.

• Barber-Colman products have participated in many notable metal working achievements in the past, will continue to progress with Industry in the future. Inquiries invited, engineering co-operation always available for new applications of standard or special Barber-Colman products.





BARBER B-C COLMAN

PRODUCTS

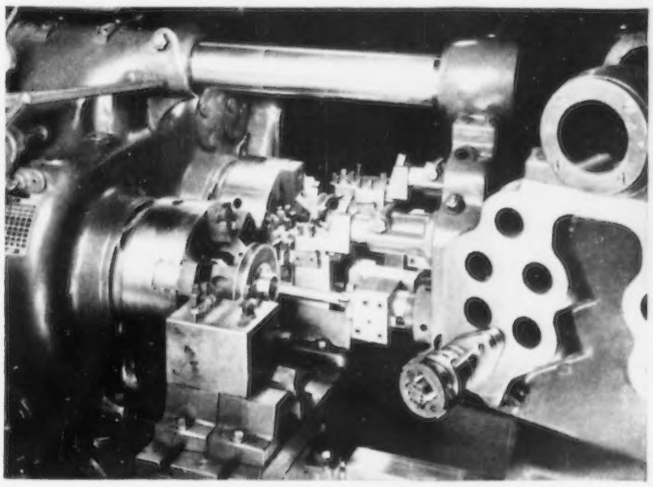
MILLING CUTTERS, HOBS, HOBBING MACHINES, HOB SHARPENING MACHINES, REAMERS, REAMER SHARPENING MACHINES, SPECIAL TOOLS

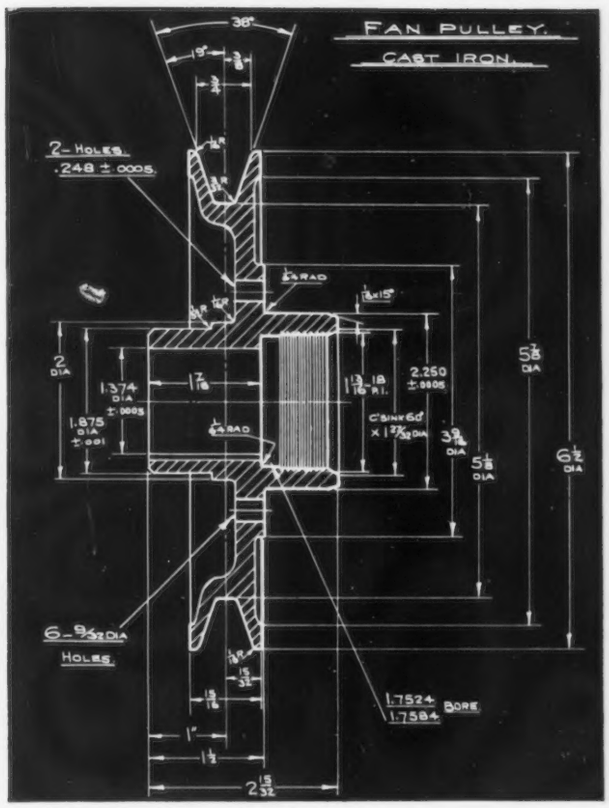
BARBER-COLMAN COMPANY

General Offices and Plant ROCKFORD, ILLINOIS, U. S. A.

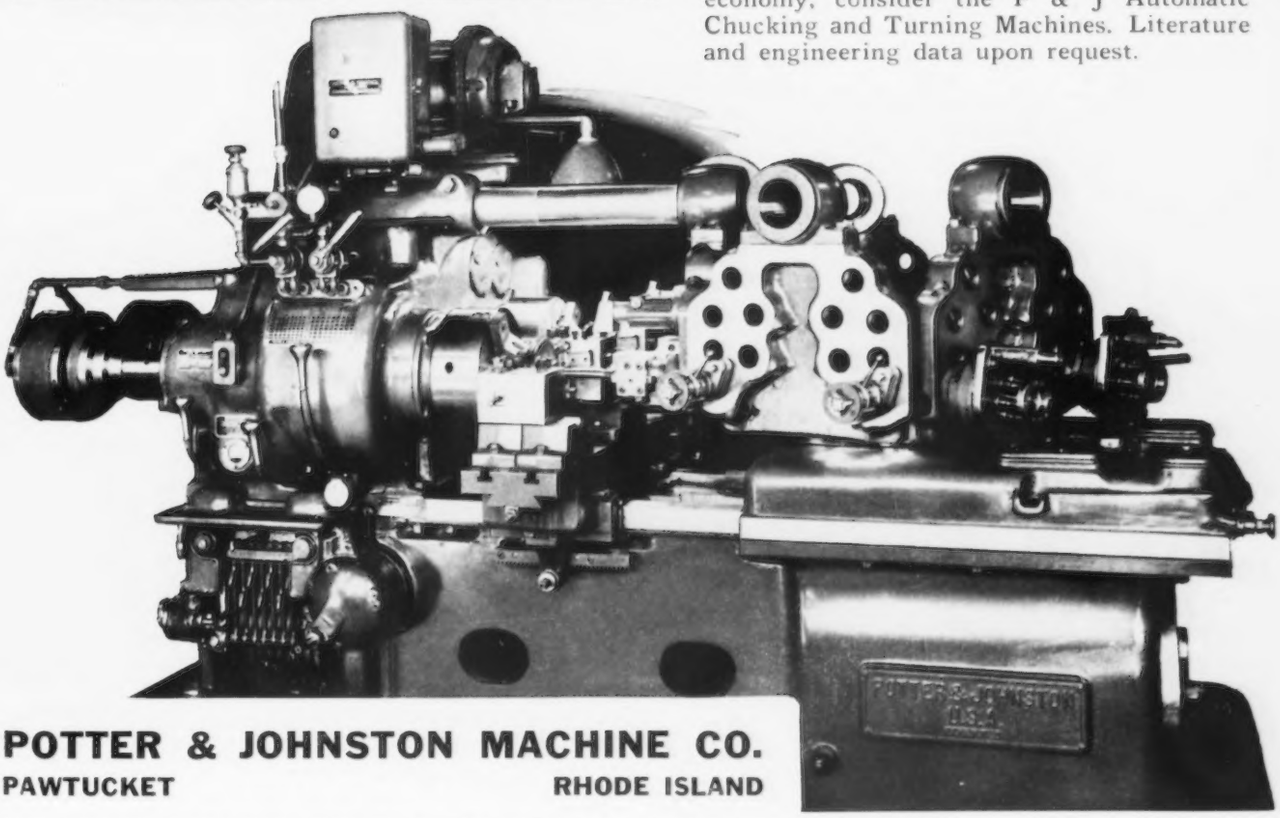
FAN PULLEYS MACHINED ON P&J 5-D-2 TWO SPINDLE POWER-FLEX AUTOMATIC

Besides completely machining this job, the P & J Automatic finishes the drilling of 8 holes and the main bore threading at one chucking. The drills are guided in hardened ground bushings. The driving lug engages with a driver set between the chuck jaws, causing the head to revolve with the work. As the drill spindles are carried around a fixed pinion which drives the drills, the turret moves forward to complete the 8 holes. One man can easily handle two of these machine units.





For new versatility and greatest possible economy, consider the P & J Automatic Chucking and Turning Machines. Literature and engineering data upon request.

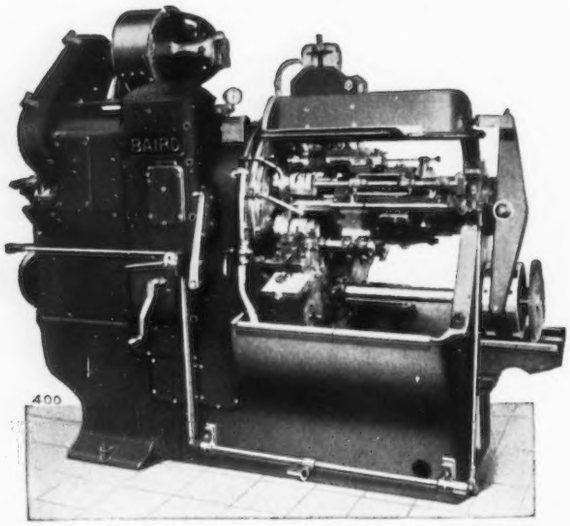


POTTER & JOHNSTON MACHINE CO.

PAWTUCKET **RHODE ISLAND**

Factory representatives for New England, Eastern New York, New Jersey—Western New York, New Jersey, Eastern Pennsylvania, Maryland, Delaware — Michigan, Toledo, O.—Ohio, Western Pennsylvania—Illinois, Missouri, Wisconsin, Iowa, Indiana. Also by following agencies: Star Machinery Company, 1741 First Street, South Seattle, Washington; Henes-Morgan Machinery Co., 2026 Santa Fe Avenue, Los Angeles, Calif.; Jenison Machinery Company, 20th & Tennessee Streets, San Francisco, Calif.; Arthur Jackson Machine Tool Company, 60 Front Street, West, Toronto 2, Ontario; Arthur Jackson Machine Tool Company, 437 Grosvenor Avenue, Montreal, Canada; Burton Griffiths & Co., Ltd., Birmingham, England; R. S. Stokvis et Fils, Paris, France; R. S. Stokvis & Zonen, Rotterdam, Holland; R. S. Stokvis et Fils, Brussels, Belgium; Maskinaktiebolaget Karlebo, Stockholm 1, Sweden; Ing. Ercole Vaghi, Milano, Italy; Yamatake & Co., Ltd., Tokyo, Japan; (Imperial Export Company, 44 Whitehall Street, New York) N. Y.; Almacoa, Zurich, Switzerland; Be-Te-Ha, Warschau, Poland; Schuchardt es Schutte, Budapest, Hungary.

BAIRD HIGH PRODUCTION MACHINE TOOLS



A BAIRD 7" Six Spindle Horizontal Indexing Chucking Machine

Multiple Spindle Automatic Lathes
Indexing and Continuous
Horizontal and Vertical
Special Automatic Machines

designed and built to obtain highest production.

Machines for turning, facing, drilling, threading, milling, and so forth.

If you require machines for high production, send sample and print of the part to BAIRD for a report.

No obligation to

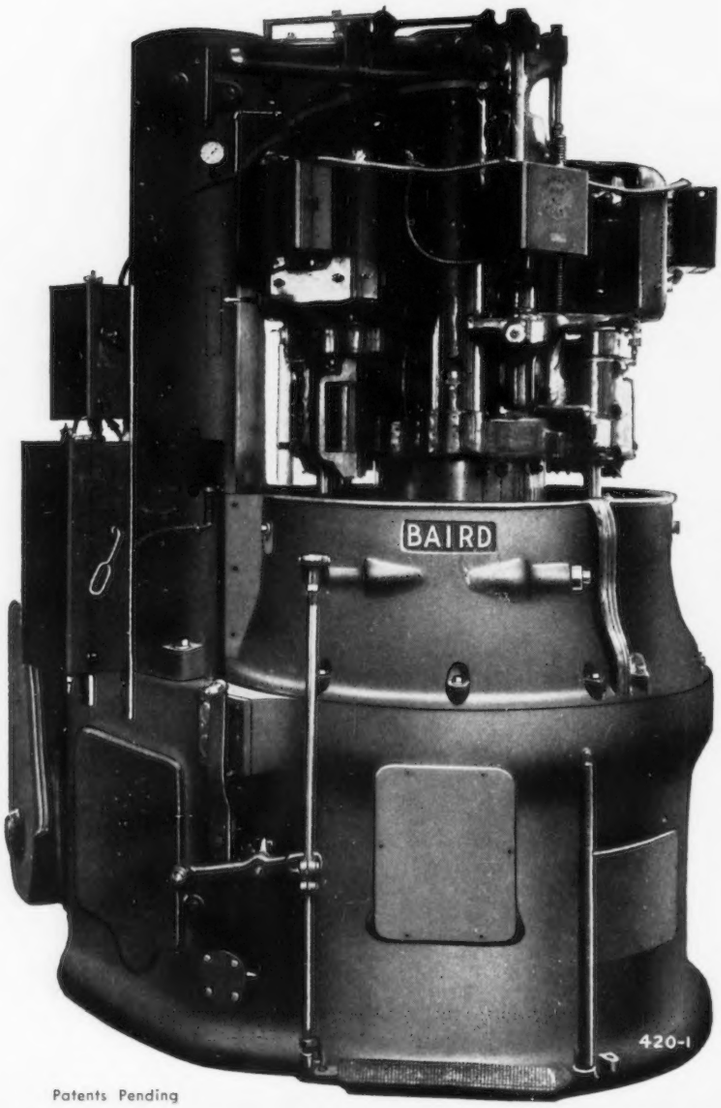
"ASK BAIRD ABOUT IT"

BAIRD AUTOMATIC GRINDERS, GRINDING AND TURNING MACHINES

BAIRD specialty is the designing and constructing of high grade high production machinery.

Save your time by sending to BAIRD sample and prints of the part you wish to produce in quantity and let BAIRD report the findings of its engineers.

No obligation.



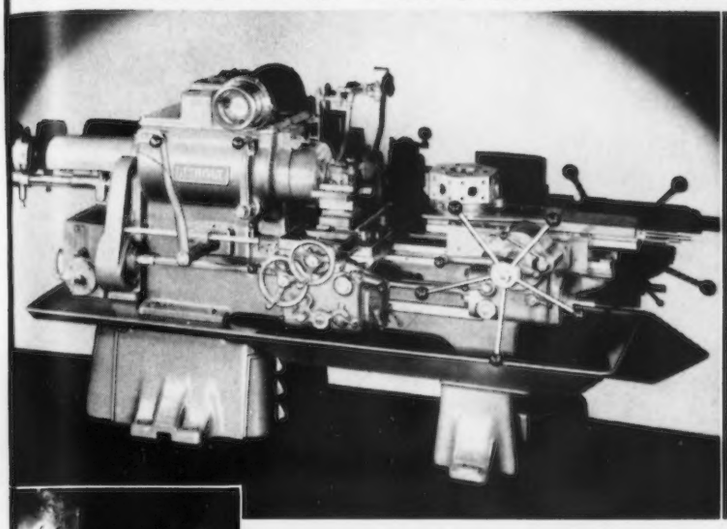
AUTOMATIC BAIRD MACHINERY

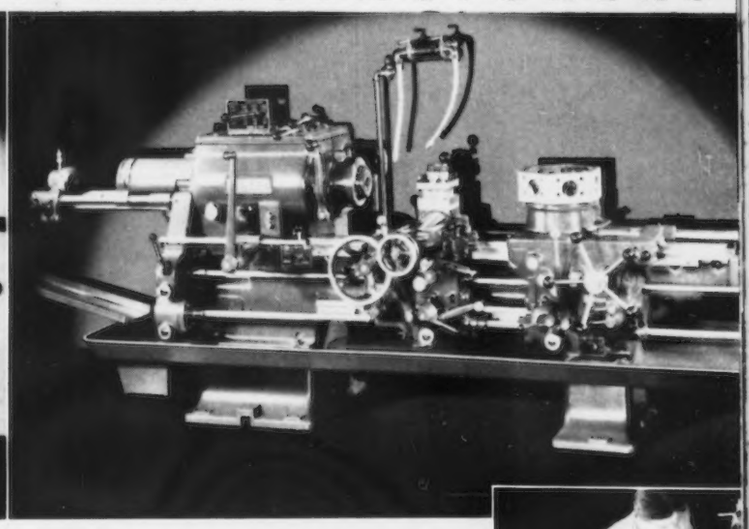
THE BAIRD MACHINE CO.
BRIDGEPORT, CONN., U. S. A.

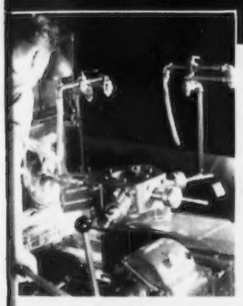
Joe Baird started business in 1846

Patents Pending

THE REMARKABLE SPEED AND PRECISION OF THESE GISHOLT MACHINES MAKE THEM THE CHOICE OF LEADING AIRCRAFT MANUFACTURERS

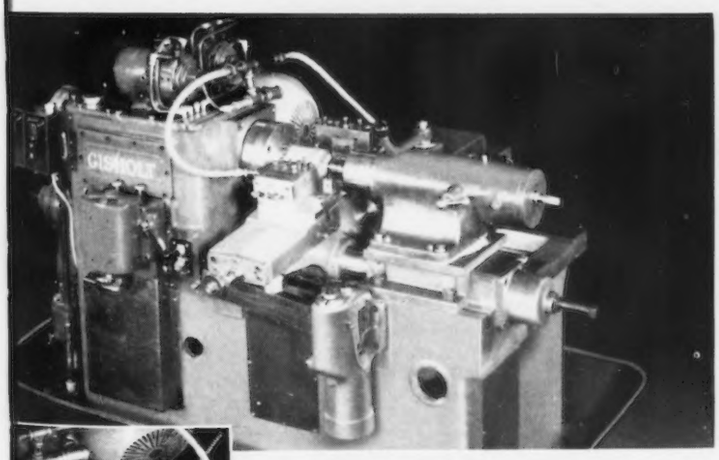


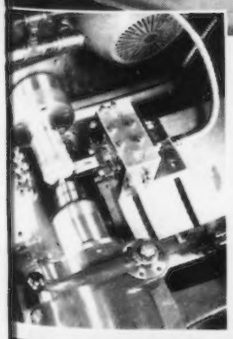




UNIVERSAL RAM-TYPE TURRET LATHES are built in three sizes, with bar capacity from 1½"x10" to 2½"x14"; chuck sizes from 8" to 15". Used for the manufacturing of miscellaneous parts. (at left) Small drive gears for airplane governors are machined of special steel to bearing finish limits of .0002", minus .0000"

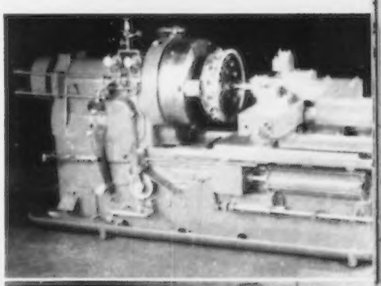
HIGH PRODUCTION TURRET LATHES are built in three sizes, with bar capacity from 2½"x36" to 4½"x48"; chuck sizes from 12" to 21". Used for parts requiring close limits and high finish. (at right) Propeller blade bushings of special bronze are machined to a mirror-like finish in two operations, requiring a total of 12 minutes.





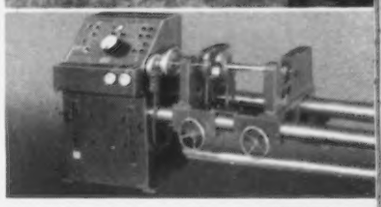
No. 12 AUTOMATIC PRODUCTION LATHE has a 16¾" maximum swing, 23" maximum length. For high production of parts such as pistons, bevel gears, straight gears, etc. Tooling change-over averages only 16 minutes. Has complete automatic cycle, hydraulically controlled. 3⅝" diameter aluminum pistons are machined in 2 operations, requiring 16 seconds per operation, floor to floor.

THE STANDARD SIMPLIMATIC has a 33½" swing, 18" to 28" chuck. It is shown here tooled for machining camshaft housings for airplane engines. Used also for such parts as impeller collars, reduction gear housings, exhaust manifolds, etc. This machine is completely automatic in operation.



BALANCING PROPELLERS on Gisholt Static Balancing Machine. These machines are available in three sizes.

BALANCING CRANKSHAFTS for airplane engines on a Gisholt Dynetric balancing machine which measures and locates the amount of combined static and dynamic unbalance in these crankshafts in 45 seconds.

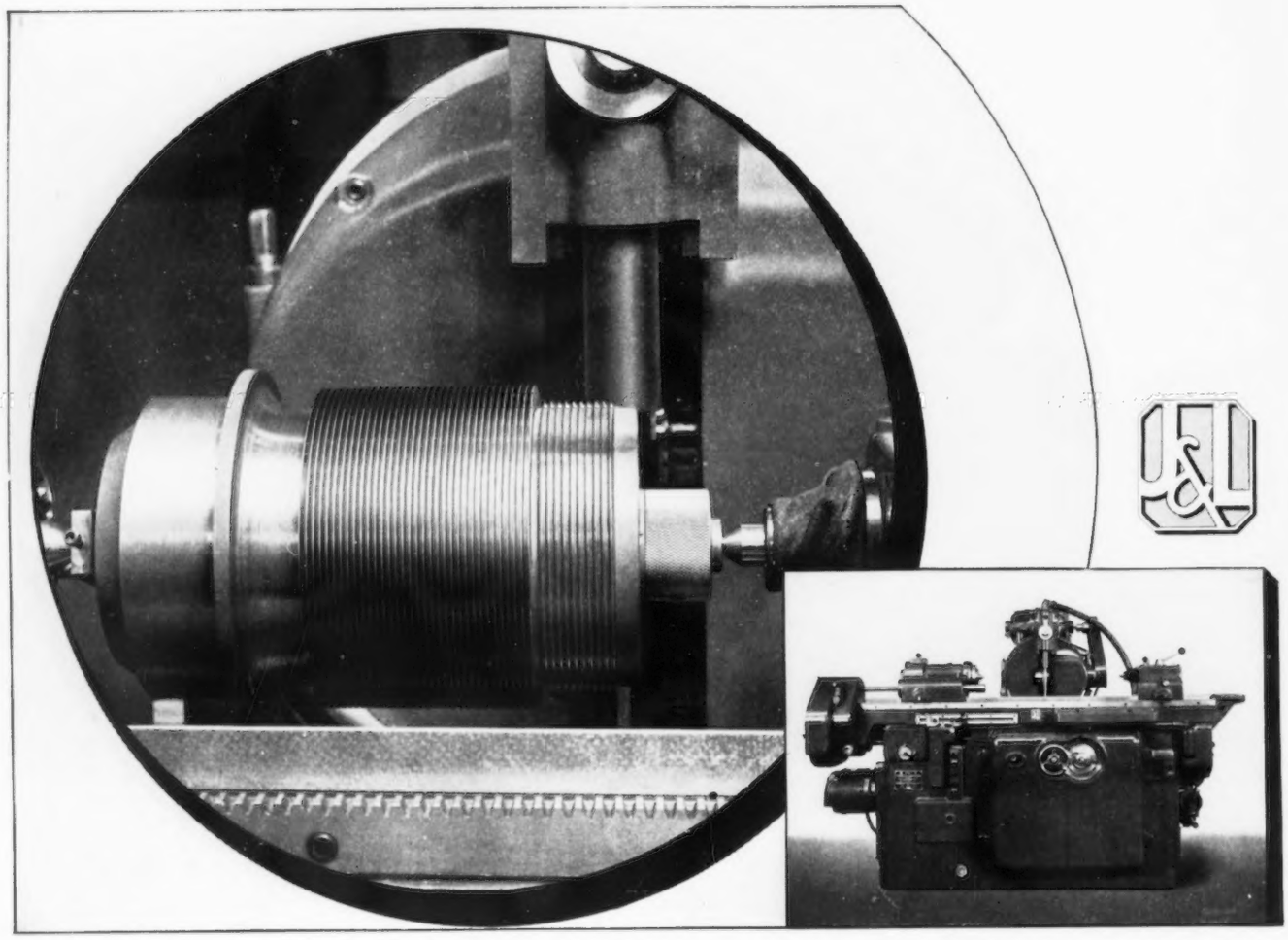


For complete operating data and other information on Gisholt equipment, see your nearest Gisholt representative or write us.

GISHOLT
MACHINE COMPANY

1215 EAST WASHINGTON AVENUE, MADISON, WISCONSIN, U. S. A

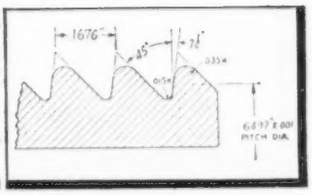
TURRET LATHES • AUTOMATIC LATHES • TOOL GRINDERS • BALANCING MACHINES



GRINDING BUTTRESS THREADS ON THE J&L THREAD GRINDER

The Answer—
TO A DIFFICULT THREADING PROBLEM

THE buttress thread on airplane cylinder barrels is of vital importance, because the cylinder head, with valve seats and ignition plugs, is secured to the cylinder by this thread.



The J&L Automatic Thread Grinder, chosen by a large manufacturer of airplane engines, produces buttress threads with an extremely smooth finish, with correct lead, shape and pitch diameter. Note the rounded tops and bottoms on the thread—these are obtained *automatically* by the use of the J&L Pantograph Wheel Truing device.

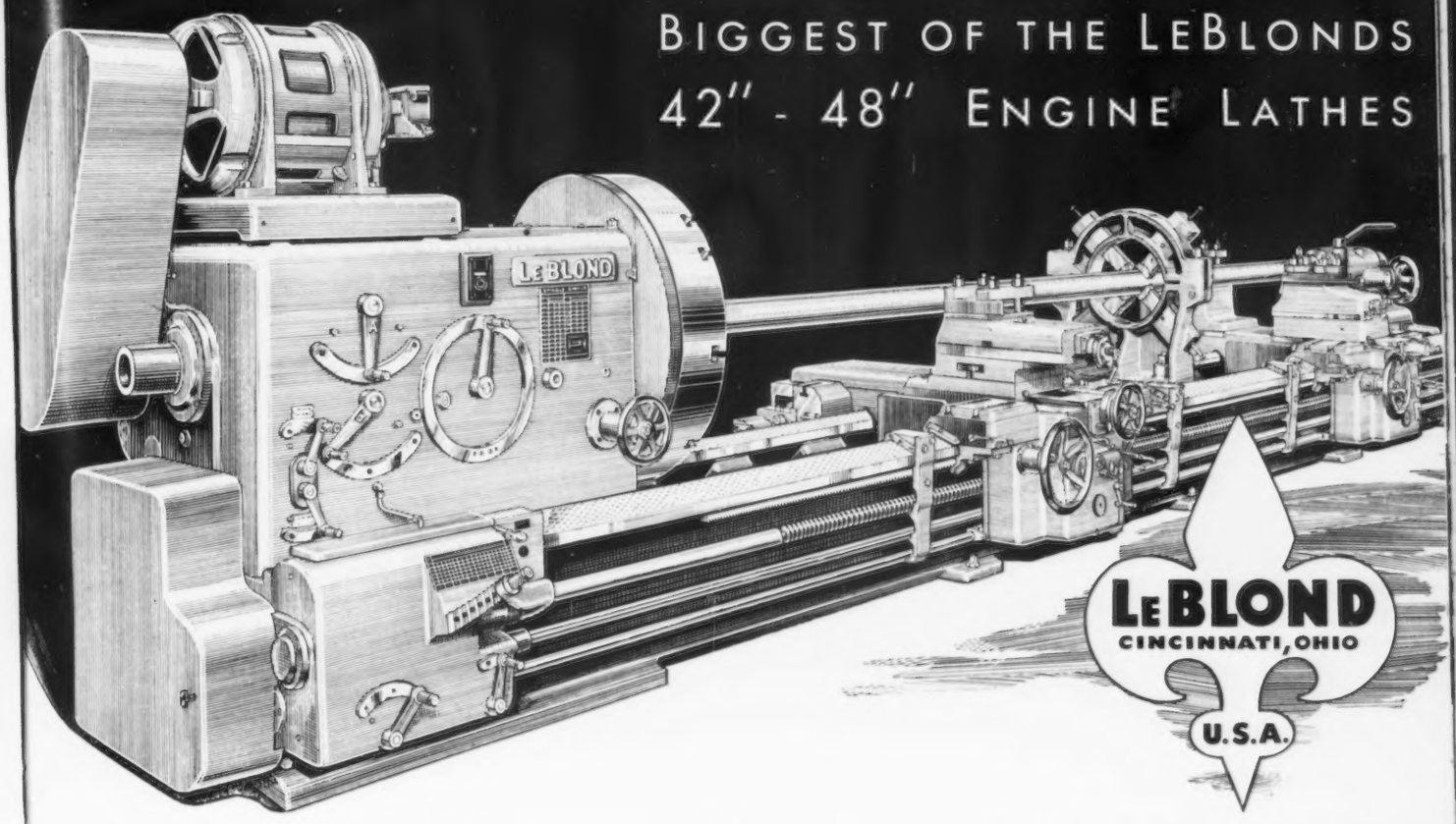
Automatic wheel truing keeps the wheel dressed to the correct shape, and automatic sizing feeds the wheel in a predetermined amount at each pass. The machine stops when size is reached. Four barrels per hour are ground, this rate including loading time and an allowance for extras. One operator easily cares for two machines, producing eight finish threaded barrels each hour.

Send for your copy of the 20-page J&L Thread Grinder catalogue. There is no obligation.

JONES & LAMSON MACHINE COMPANY
Springfield, Vermont, U. S. A.

The BIG SWING

BIGGEST OF THE LEBLONDS
42" - 48" ENGINE LATHES



No. 6 in a series of pen portraits presenting the tools that serve production progress.

Gigantic in Size and Power...
micrometer Accuracy in Performance

LeBlond "Big Swing" 42" and 48" lathes . . . biggest of a long line of production-doubling machines . . . now designed specifically for heavy duty operations. The "Big Swing" turns stock of huge proportions over a giant swing of four feet . . . with micrometer, hair-spring accuracy.

Here are a few of the many step-ahead features you'll find in the "Big Swing":

54 SELECTIVE FEED CHANGES can be made without changing gears. Quick change box sealed in oil-tight casting.

HOLLOW SPINDLE TAILSTOCK: Tailstock spindle, hollow bored, allowing bar-stock to be passed freely through tailstock as well as through headstock.

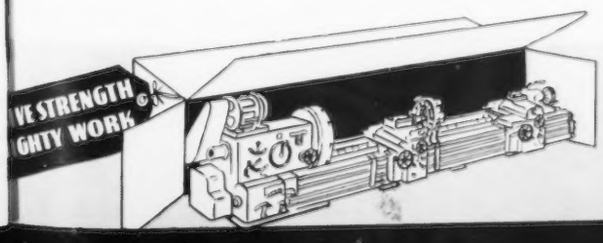
GEARED TAPER ATTACHMENT cuts tapers from 0 to 6" with maximum turning length of 25 feet at one setting. Can be arranged for combined cross-length feed in apron for wide angles.

FIFTEEN TON BED: Massiveness of the "Big Swing" characterized by the massive bed of alloy iron, providing a close-grained, hard-wearing surface.

POWER RAPID TRAVERSE: The carriage is moved to and from working position at rate of 20 feet per minute.

POSITIVE LUBRICATION: One-shot oil pump in apron lubricates all apron bearings, cross feed screw, cross slide ways and bed ways. Sight gauge on front of headstock permits operator at all times to check operation of the lubrication system.

To plant executives interested in reducing cost and increasing production where heavy duty operations are concerned—to these LeBlond offers its "Big Swing" bulletin. For further details on the "Big Swing", send for this folder today. It's yours for the asking. Address Dept. L-21.



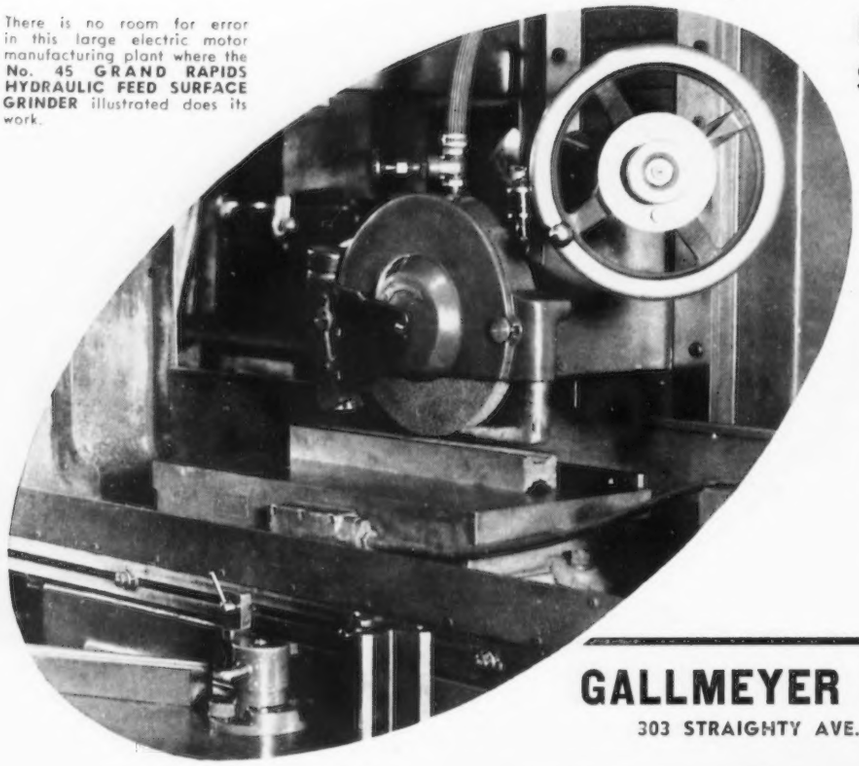
THE R. K. LEBLOND MACHINE TOOL COMPANY
CINCINNATI, OHIO

BUILT FOR SERVICE

Grand Rapids

HYDRAULIC FEED SURFACE GRINDERS

There is no room for error in this large electric motor manufacturing plant where the **No. 45 GRAND RAPIDS HYDRAULIC FEED SURFACE GRINDER** illustrated does its work.

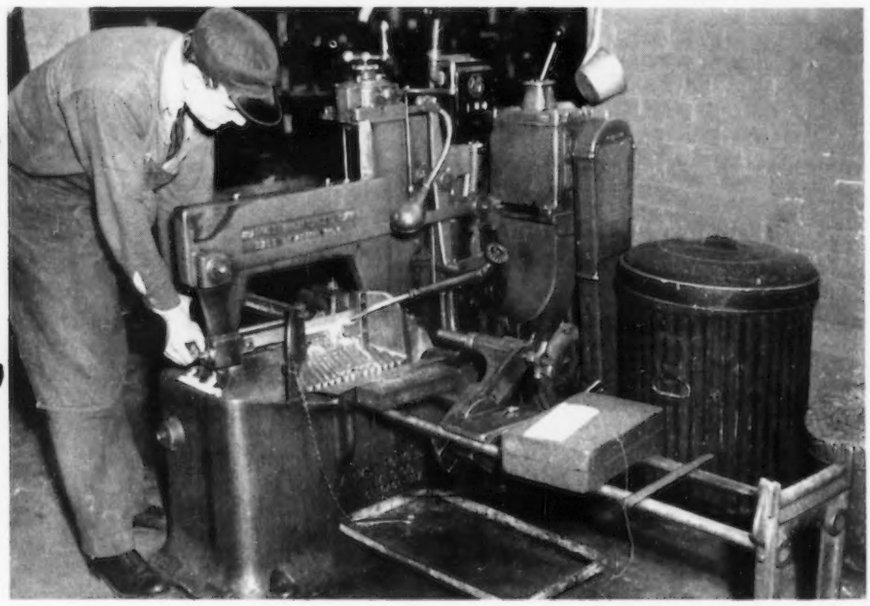


That the present GRAND RAPIDS line leads in its field is shown by the preference it receives where constant operation with tough alloys under high-speed production schedules requires equipment that will do ***more*** than just a good job —and do it steadily. Your own needs will be best fulfilled by the correct GRAND RAPIDS GRINDER. This grinder has the smooth high speed that you need to do the finest accurate work.

GALLMEYER & LIVINGSTON CO.

303 STRAIGHTY AVE., S.W. GRAND RAPIDS, MICHIGAN

Like a Modern Navy...



MARVEL AUTOMATIC PRODUCTION SAWS

No. 6A Capacity 6"x 6"
No. 9A Capacity 10"x10"

. . . modern **INDUSTRY** must be supported by automatic machine tools of tremendous production capacity, if our industries are to survive in world competition, and our higher American wage scales maintained.

In many hundreds of industrial plants, as well as in our government's armament shops, **MARVEL** Automatic Production Saws are consistently making their contribution to the maintenance of the American Standard of Living through their higher speed and greater efficiency in output.

The American Standard of Living is undeniably much higher than that of any other nation—first and foremost because American plants are utilizing more automatic production machinery than our foreign competitors.

What we need here, to further raise our living standards is **MORE** automatic machinery to make **MORE** economic goods available at **LOWER COST** to **ALL** our people.

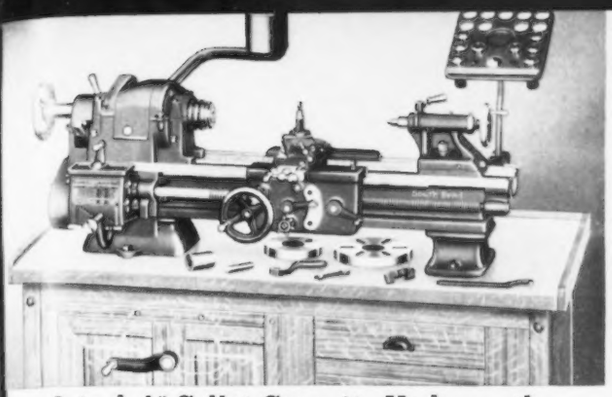
You can make your contribution to raising American living standards by replacing your sawing equipment with modern **MARVEL AUTOMATIC HACK SAWING MACHINES.**

MARVEL No. 6A. Heavy Duty, High Speed Saw at the Springfield Armory. A few saws of this model take care of sawing all rifle barrels.

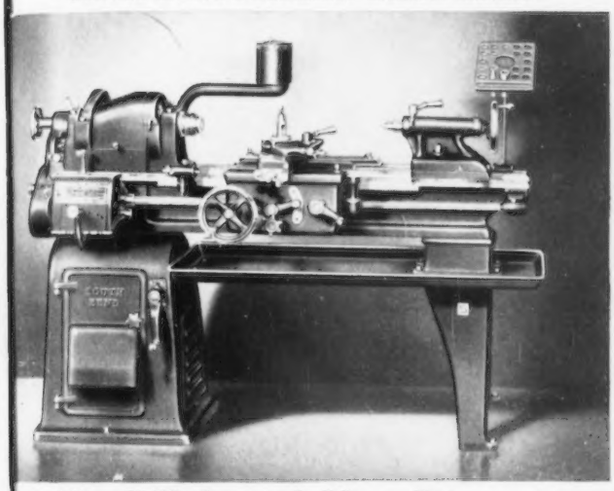
MARVEL

Write for Catalog

ARMSTRONG-BLUM MFG. CO. *"The Hack Saw People"*
5749 Bloomingdale Ave., Chicago, U. S. A. Eastern Sales: 199 Lafayette St., N. Y.



9-inch 1″ Collet Capacity Underneath Motor Drive Precision Bench Lathe



13″ x 5′ Underneath Motor Drive Tool Room Lathe

SOUTH BEND LATHES

A Modern Lathe at a Moderate Price

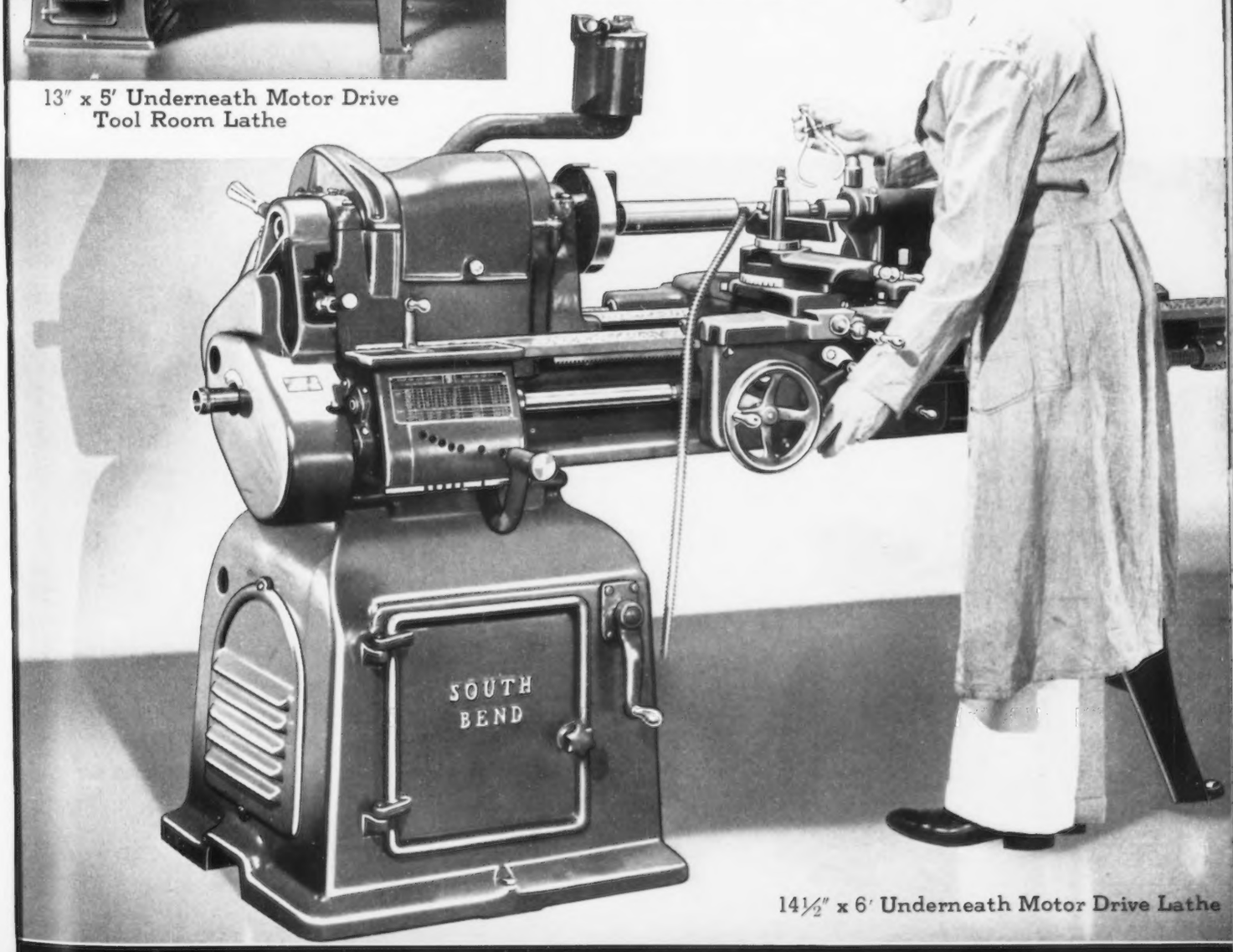
For more than thirty years South Bend Lathes have been giving efficient, dependable service in the tool rooms and production departments of America's leading industries. Modern in every respect, capable of the most exacting precision machine work, they represent the maximum lathe value per dollar of cost.

Manufactured in 9″, 11″, 13″, 14½″ and 16″ swing; 3′ to 12′ bed lengths; Quick Change Gear and Standard Change Gear types; Countershaft and Motor Drive. Write for a copy of General Catalog No. 98.

Immediate Delivery can be made on popular sizes from dealer display stocks in principal cities, a few of which are listed below. Write for name of dealer nearest you.

DEALERS IN PRINCIPAL CITIES

Boston—MacKenzie Mach. Co.
Chicago—C. B. Burns Mach. Co.
Cleveland—Reynolds Mach. Co.
Detroit—Lee Machinery Co.
Los Angeles—Eccles & Davies
Milwaukee—W. A. Voell Mach.
Newark—I. R. Edwards Mach.
New York—A. C. Colby Mach.
Philadelphia—W. B. Rapp Mach.
Pittsburgh—Tranter Mfg. Co.
Providence—G. T. Reynolds & Son
San Francisco—Moore Mach. Co.



14½″ x 6′ Underneath Motor Drive Lathe

SOUTH BEND LATHE WORKS

Lathe Builders Since 1906

587 EAST MADISON STREET
SOUTH BEND, INDIANA, U.S.A.

TRADE MARK SOUTH TWINS BEND ENGINE LATHES

Put These Three Features To Work

Cutting Billet Grinding Costs for You

THERE are three important features of Norton Resinoid Billet Grinding Wheels that are enabling them to cut cleaning costs for many mills.

1. ***Alundum Abrasive***—special Norton crushing and sizing methods give strong, tough, ruggedly shaped grains to meet the severe service of billet grinding.
2. ***Resinoid bond***—special formulae developed by the Norton laboratories for billet work.
3. ***Controlled Structure***—a Norton manufacturing process that makes it possible to regulate grain spacing to fit the requirements of each individual job and also insures closer wheel duplication.

These three features can cut billet grinding costs for you just as they are for others.

NORTON COMPANY
WORCESTER, MASS.
New York Chicago Detroit
Philadelphia Pittsburgh Hartford
Cleveland Hamilton, Ont.
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W-706

NORTON ABRASIVES

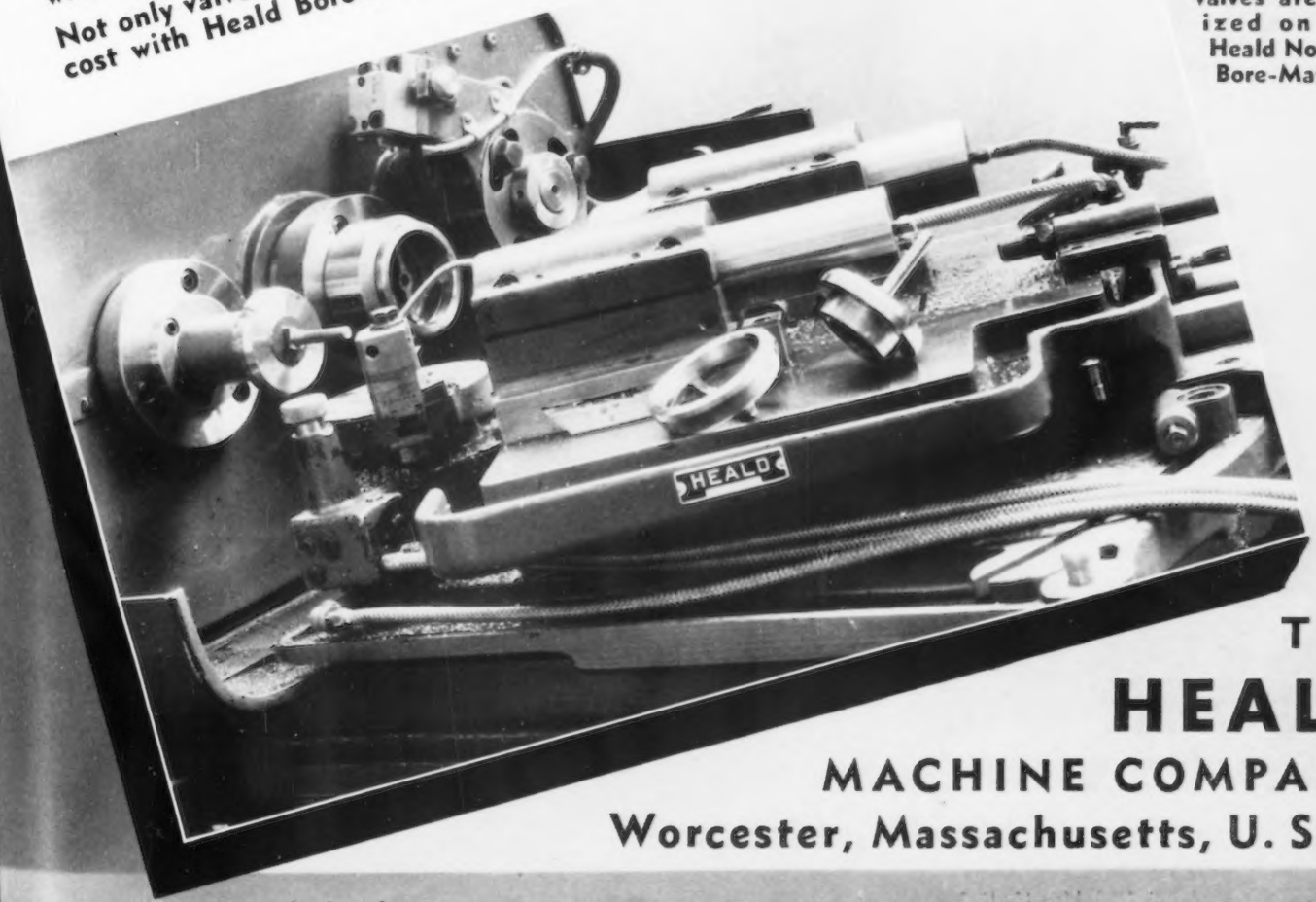
GOOD PRODUCTS *Made Better* BY BORIZING

Make a better mousetrap, and be prepared to put on a third shift — so the old saying goes. Today, you not only have to build a better product, but produce it at lower costs as well. You can do both by borizing on Heald Bore-Matics — hundreds of installations have proven that Bore-Matics actually improve quality of accuracy and finish at reduced costs.

Modern valves today are an example of how a good product can be made better by borizing. Certain types of valves are made with hardened stainless steel seats — an important improvement in valve construction. These fine valves are made still better by borizing on Heald Bore-Matics — because valve seats can be consistently finished to an extremely high degree of surface quality — with very little lapping required — at higher production rates.

Not only valves, but any good product can be made better at less cost with Heald Bore-Matics — let us tell you how.

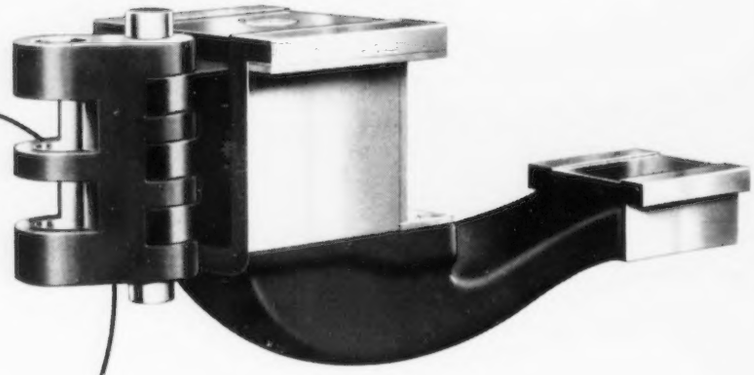
Seat Rings and Plug Discs for modern quality valves are borized on this Heald No. 47A Bore-Matic.



THE
HEALD
MACHINE COMPANY
Worcester, Massachusetts, U. S. A.

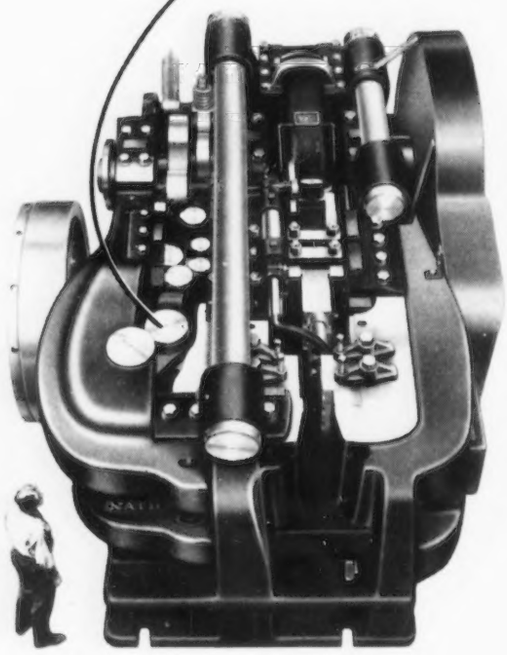
Use a Heald for **PRECISION · PRODUCTION · PROFIT**

SINCE 1917



INTERLACED TOGGLES

For a Rigid Grip

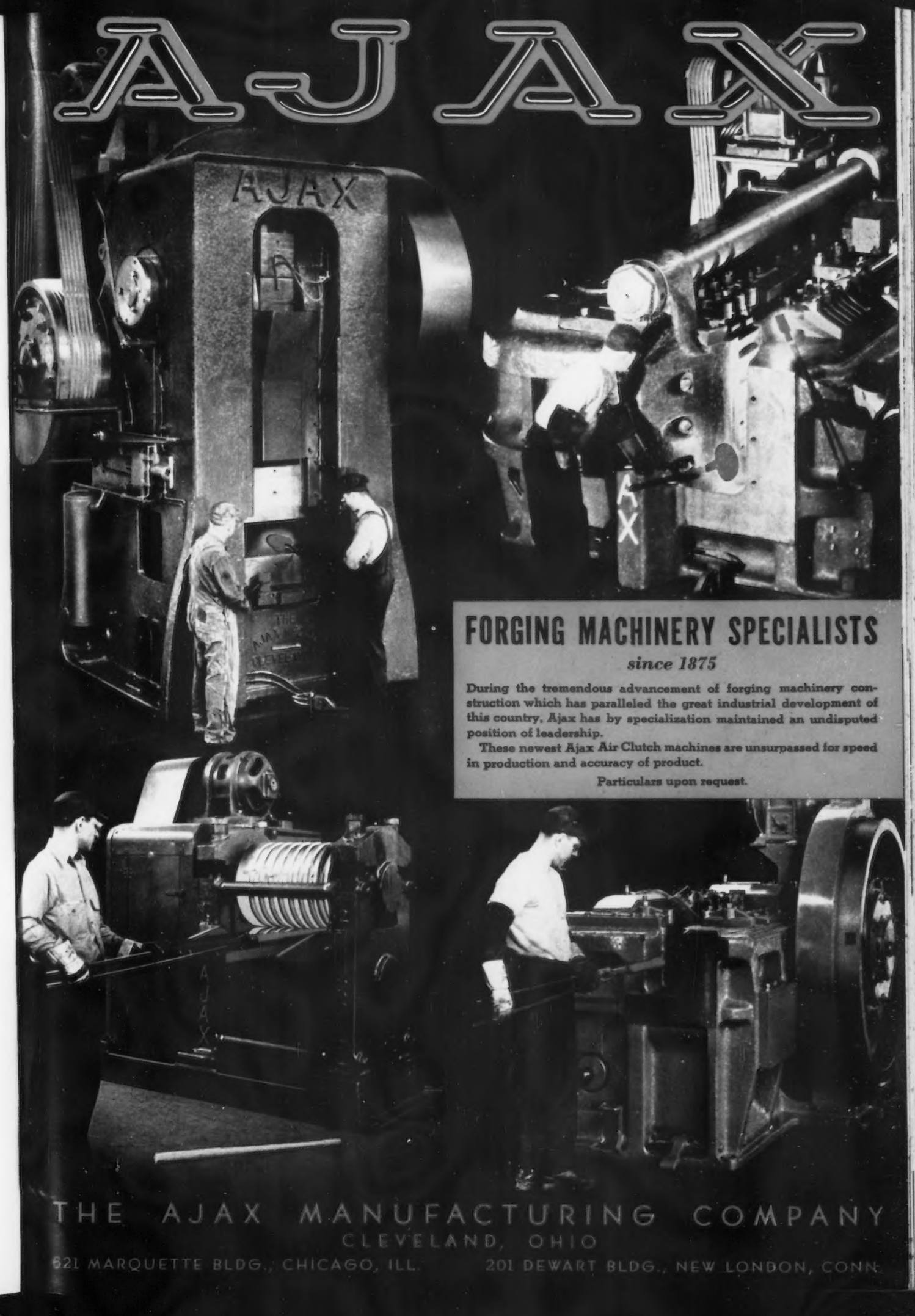


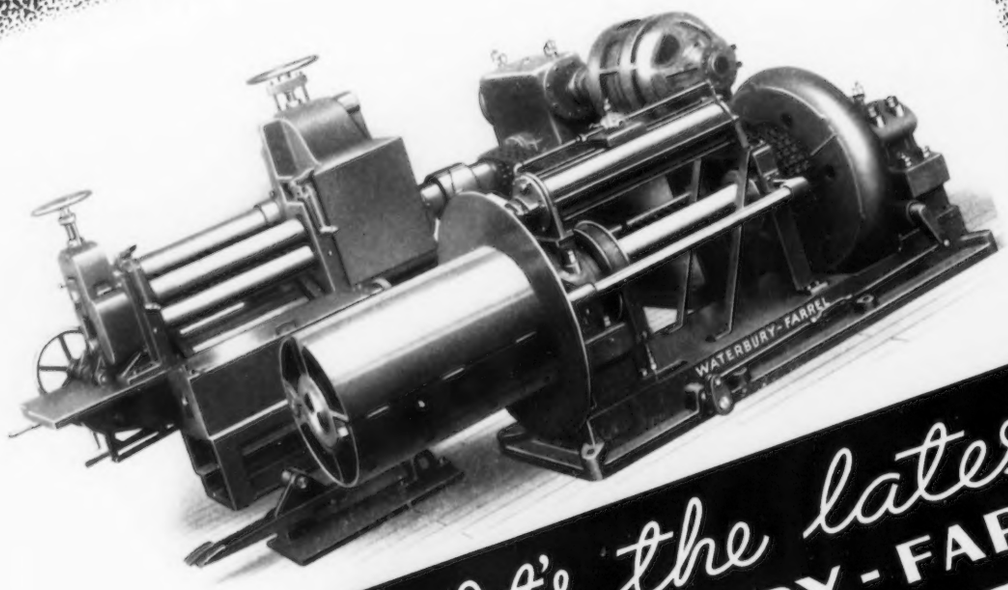
THE toggles of a Forging Machine operate under enormous pressure. Knuckles such as used in a coining press will not do.

Interlaced toggles with enormous solid round pins having ample bearing area to withstand the pressures, introduced by National Engineers in 1917, are still the most effective means for meeting such severe requirements.

NATIONAL
MACHINERY COMPANY
TIFFIN, OHIO.

New York Detroit Chicago


AJAX
AJAX
FORGING MACHINERY SPECIALISTS
since 1875
During the tremendous advancement of forging machinery construction which has paralleled the great industrial development of this country, Ajax has by specialization maintained an undisputed position of leadership.
These newest Ajax Air Clutch machines are unsurpassed for speed in production and accuracy of product.
Particulars upon request.
THE AJAX MANUFACTURING COMPANY
CLEVELAND, OHIO
621 MARQUETTE BLDG., CHICAGO, ILL.
201 DEWART BLDG., NEW LONDON, CONN.



It's the latest WATERBURY-FARREL GANG SLITTER and WINDER

If you use large quantities of metal in various widths, you can not afford to be without efficient slitting machinery for making your own strip. It's economy.

A Heavy Duty Gang Slitter, flexible-coupled worm gear motor drive; a winder, chain-driven from the slitter, with 24" collapsible drum suited to either "slip friction" or "pull-through" operation, and a compound air push-off suitable for 7000 pound coils; an independent motor-driven rotary scrap-cutter.

Similar equipment available in sizes to suit any slitting requirement; also mill-type slitters for trimming and numerous special purpose slitting machinery. See Circular 898-S.

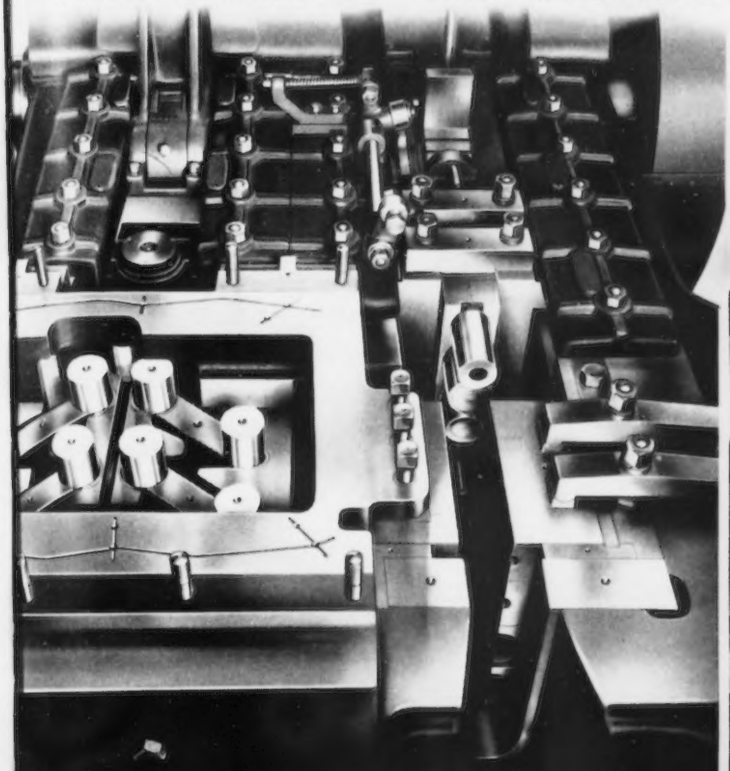
FOUNDED WATERBURY FARREL 1851

WATERBURY FARREL
FOUNDRY & MACHINE COMPANY
WATERBURY • CONNECTICUT • U·S·A

• CUTTER EQUIPMENT • SCRAP CUTTERS • WINDERS • COILERS •

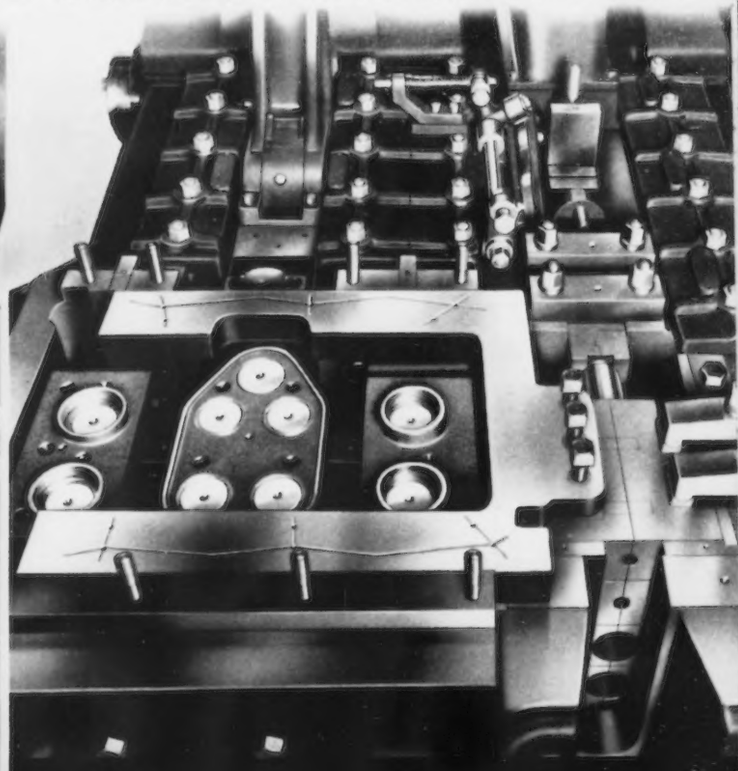
MORE ACCURATE FORGINGS—LONGER DIE LIFE

WITH ACME "XN" DOUBLE TOGGLE CONSTRUCTION



TOGGLES, SHOWING DIES IN OPEN POSITION

The ACME Die Slide functions only as an aligning member for the dies, which are backed up through their entire height with a continuous bearing on heavy *double* toggle pins, integral with connecting body. Top bearing plate containing bushings is shown in position, *at right;* removed, *at left.*



TOGGLES, SHOWING DIES IN CLOSED POSITION

ACME *Double* Toggles, standard on 2-inch and larger machines, as shown, rigidly support the dies against upsetting action and eliminate any tendency for dies to open and cause excessive flash on forgings. A heavy ribbed steel cover and tie-plate seals toggle mechanism against scale and water, clamping across movable die slide ways, *making tie-rods unnecessary.*

ACME Double Toggle Cluster Assembly used on 2-inch and larger machines

● Among the important features of ACME XN Forging Machines, hardly any one is more important than the ACME *Double* Toggle construction, which directly affects tool and die life, accuracy of the upset, correct gather of the metal being forged, and ultimate maintenance costs. Eliminating any tendency for dies to open under heaviest upsets, the powerful, heavy *double toggles* in gripping or closed position set themselves in a straight line of support. Large diameter toggle pins, integral with connecting body, support gripping dies with a continuous bearing for their entire length and height, insuring uniform gripping in all parts of the dies. This construction not only provides twice the pressure area of hinge-type pins, but eliminates shoulder wear on pins and bushings. Large pin areas reduce pressure per square inch, which is reflected in lower maintenance costs. We welcome your inquiry for further information on ACME XN Forging Machine features. Our engineers are at your service on any forging or die problem.

THE ACME MACHINERY COMPANY

Established 1882

4535 ST. CLAIR AVENUE

Cleveland, Ohio

FORGING • THREADING • TAPPING

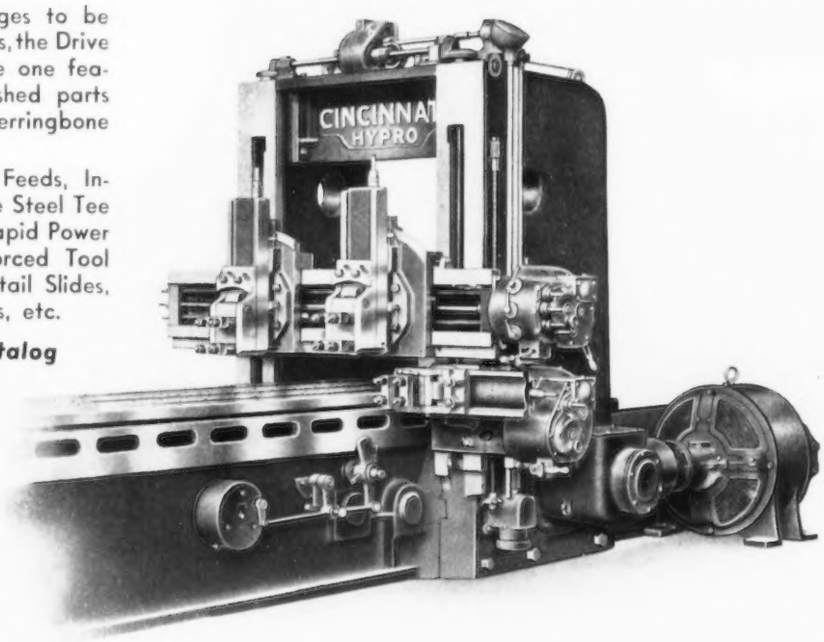
BOLT • NUT • RIVET MACHINES

HERRINGBONE DRIVE PROVIDES SMOOTH FINISH

Among the numerous advantages to be found in Cincinnati Hypro Planers, the Drive feature is outstanding. It is the one feature which permits smooth finished parts through the use of a complete herringbone balanced gear train.

Other features: Selective Dial Feeds, Instantaneous Rail Lift, Renewable Steel Tee Slots, Independent Feeds and Rapid Power Traverse to the Heads, Reinforced Tool Block Abutment, Inverted Dovetail Slides, Massive Pyramid Type Housings, etc.

Write for Complete Catalog



The Cincinnati Planer Co.—Cincinnati, Ohio, U. S. A.

Chuck Manufacturer Proves Economy of Noblewest Precision Marking

500% PRODUCTION INCREASE

Jacobs Manufacturing Company, makers of chucks, found that Noble & Westbrook's rapid production equipment increased their marking production 500%. Quality too, was improved . . . impressions becoming sharper and clearer.

Noble & Westbrook precision equipment offers you many advantages for faster, better marking: Its rolling process combines higher speeds with accuracy. Two or more operations can often be combined in one. Marking dies are adjustable. Automatic safety devices and registration of numbering or marking. Automatic unloading.

Investigate the money-saving possibilities of Noble & Westbrook Precision Marking equipment. Let us analyze your marking problems, suggest ways to improve quality, speed production No obligation.

NOBLE & WESTBROOK MANUFACTURING CO.

Specialists in rapid, precision marking equipment

22 WESTBROOK STREET
EAST HARTFORD, CONN.

NOBLEWEST IMPROVED MARKING DEVICES

22 STROKES PER MINUTE

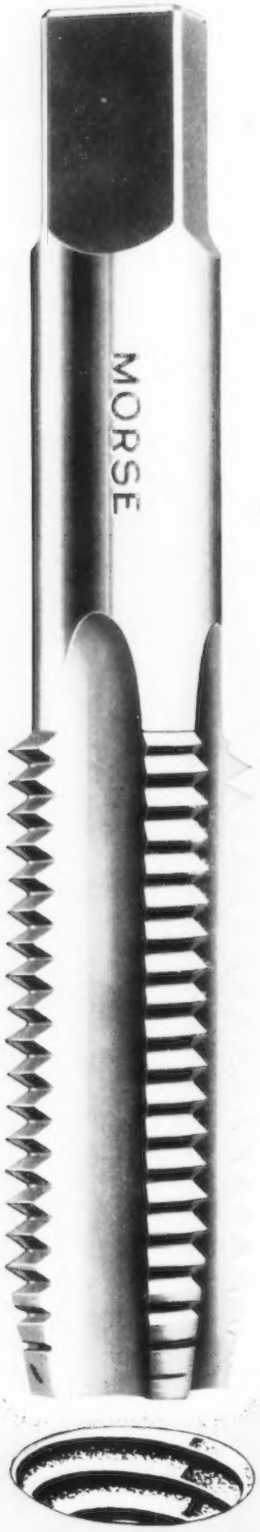
Twenty-two short working strokes a minute, a complete cycle in a little less than 3 seconds —this is the kind of press performance you need to boost production and lower unit costs.

Completely new, this 500 ton Southwark single-acting hydraulic press has a 48-inch by 41-inch platen area and a full stroke of 20-inches. You'll find it difficult to beat for speed of operation, accuracy of work, and sheer simplicity of design.

Whatever your press requirements, Southwark can help you do a better job—more economically . . . BALDWIN-SOUTHWARK CORPORATION, Southwark Division, Philadelphia; Pacific Coast Representative, The Pelton Water Wheel Company, San Francisco.

Operating Valves — Hydraulic Pumps — Accumulators — Plate Planers — Bending Rolls — Testing Equipment — Special Hydraulic Machinery

SOUTHWARK *Hydraulic* PRESSES



INDUSTRY ASSEMBLES

THE MAJORITY OF ITS PRODUCTS WITH THE HELP OF CLEAN, SHARP THREADS . . . TO KEEP TAPPING OPERATIONS AT MAXIMUM EFFICIENCY, SPECIFY MORSE . .

MORSE

THERE IS A DIFFERENCE

TWIST DRILL AND MACHINE COMPANY

NEW BEDFORD, MASS., U. S. A.

NEW YORK STORE: 130 LAFAYETTE ST. - - - - CHICAGO STORE: 570 WEST RANDOLPH ST.

How many GRINDS *do YOU get?*

You actually *use* 270° of chaser circumference—with Namco circular chaser die heads.

Take a 1" threading job for example . . . removing .015" from the faces of Namco circular chasers for each grind will net you never less than 225 grinds...Compare this with the number of grinds, the chaser life, you are getting.

What about other savings? In Namco circular chaser heads the external mounted chasers throw chips outward . . . permit faster cutting speeds. With micrometer fixture you check the grind with chaser blocks intact...every grind for every chaser is alike...every time. You remove a set of chasers in less than one minute...make your settings in the tool room, not at the expense of time and scrap loss on the job.

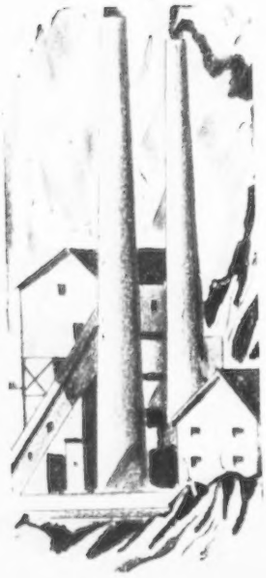
Yes sir, more grinds mean longer chaser life . . . lower cost per thread. Our 64-page catalog gives the complete Namco circular chaser story for Dies and Taps. Ask for D-38.

ove—station-
y type.
ht—revolving
e. Both simple,
ang, easy to
ust-stay accu-
e. Chasers are
erchangeable.
pacities .056" to 5"

NATIONAL ACME

170 EAST 131ST STREET • CLEVELAND, O.

ACME-GRIDLEY 4-6 AND 8 SPINDLE BAR AND CHUCKING AUTOMATICS • SINGLE SPINDLE AUTOMATICS • AUTOMATIC THREADING DIES AND TAPS • SCREW MACHINE PRODUCTS • THE CHRONOLOG • LIMIT SWITCHES • POSITIVE CENTRIFUGE • CONTRACT MANUFACTURING



... MASTERING TOO HOT

MANY MATERIALS

TO HANDLE

typifies the advanced construction features which are making Hewitt belts more useful to industry

● The handling of hot clinkers . . . "knock-out" sand . . . hot coke . . . Fuller's Earth . . . hot concentrates—and other materials that have to be handled at high temperatures (sometimes in excess of 300° F) has been completely mastered by HEWITT Conveyor Belts. The exceptional performance that companies report they receive from HEWITT Belts in this service, is convincing testimony of the advanced features we are building into all types of conveyor belts. HEWITT engineers are building unusual features into all types of conveyor belts to put them far ahead of the field. The significant point is that whether you are looking for a belt with heat-resistance . . . or greater flexibility . . . or the ability to resist acid and alkaline materials . . . or properties to withstand severe outdoor conditions . . . or supreme abrasion resistance—there's a HEWITT Conveyor Belt that will give you exceptional service. Talk it over with a HEWITT distributor. They're listed in the classified telephone directories of industrial centers under "Rubber Goods" or "Belting".

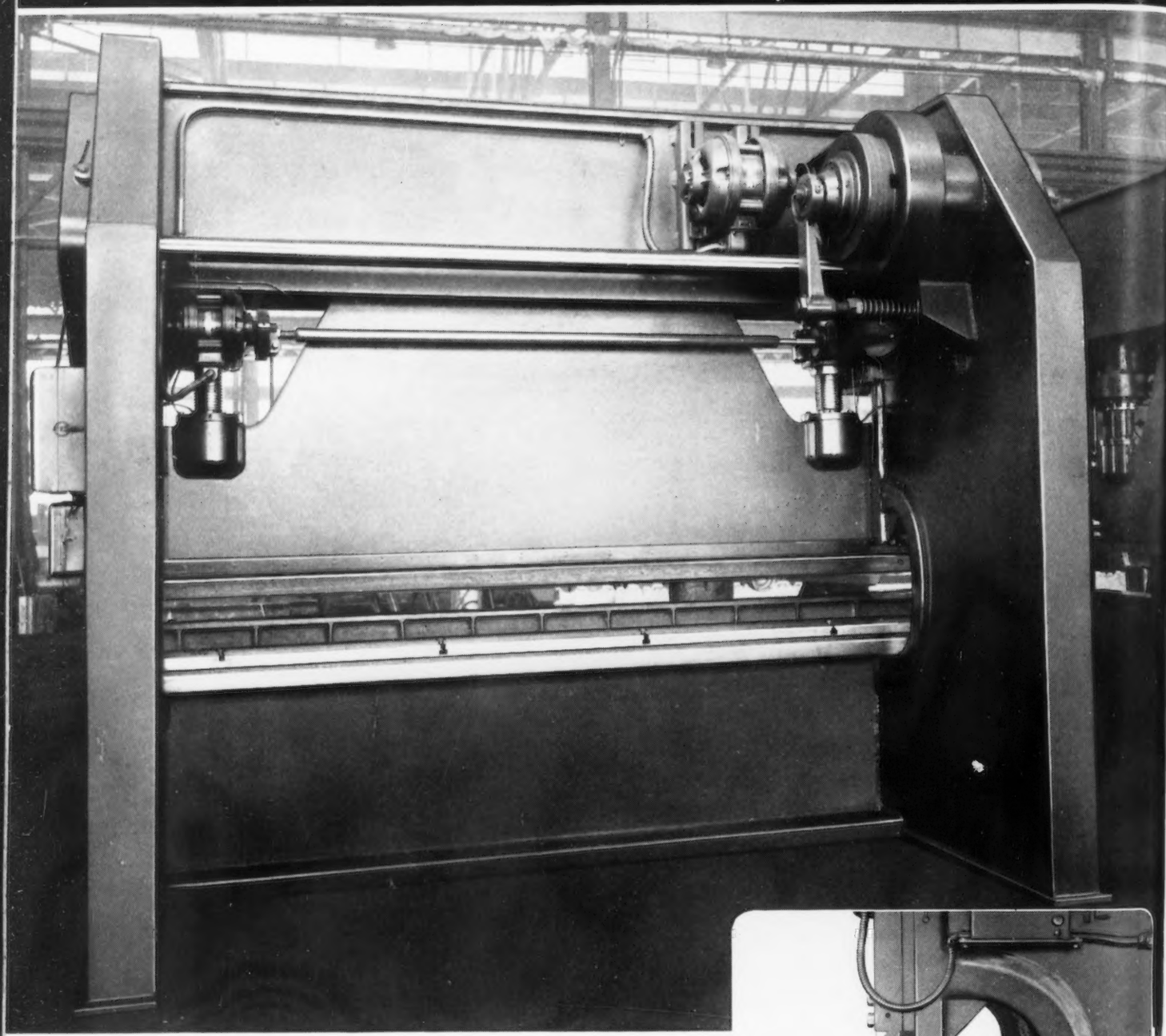
1859 For 80 years, HEWITT Brands have been recognized as outstanding examples of advanced research and exceptional craftsmanship. **1939**

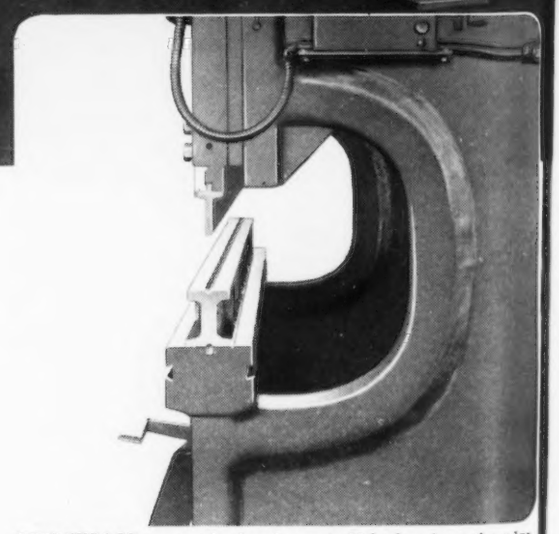
HEWITT

RUBBER CORPORATION, BUFFALO, N. Y.

HOSE • CONVEYOR AND TRANSMISSION BELTS • PACKING

STEELWELD *Bending Presses*





DEEP THROAT — permits bends up to 18 inches from the edge for the full length of the die surface.

LOOK BACK OF WHAT YOU BUY

Check these features of Steelweld Bending Machines

- Weight of the metal in the Welded One Piece Frame
- Sturdy and compact drive and clutch mechanism
- Unbreakable ball joints, located directly under the eccentrics
- Back Clearances—all machinery located high in the frame

THE CLEVELAND CRANE & ENGINEERING CO.

STEELWELD MACHINERY DIVISION

WICKLIFFE, OHIO.

CYRIL BATH & CO., GENERAL SALES AGENTS . . . . E. 70TH & MACHINERY AVE., CLEVELAND, OHIO

KEEP YOUR PRODUCT FROM GETTING RATTLED

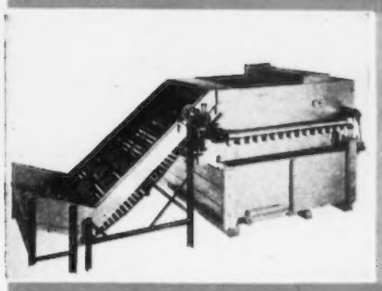
YOU WHO MANUFACTURE PRODUCTS USING SCREWS ARE FORTUNATE TO HAVE IN ONE DEVICE A METHOD OF

1. **saving up to 50% in assembly cost, and**
2. **building longer life into your products.**

The Phillips Recessed Head Screw drives faster and sets up tighter. No danger of driver slipping from the screw's recess, so power drivers are used more often. And the screws — recessed for maximum strength in the head — set up flush without pilot holes, without split heads, without burrs. ¶ There's so much more holding power in a Phillips Recessed Head Screw that you can often use *fewer* or smaller, *lower cost* sizes!

ASSEMBLY COST DOWN . . . SALES VALUE UP

DOUBLE REASONS FOR PHILLIPS SCREWS

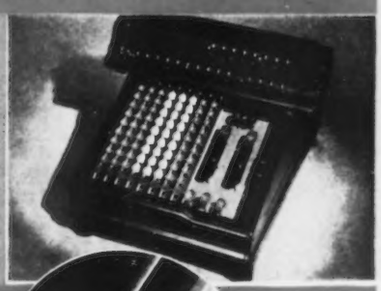


MORE WORK PER HOUR

Manufacturer of fruit and vegetable cleaning equipment finds use of Phillips Screws saves 35% in assembly time.

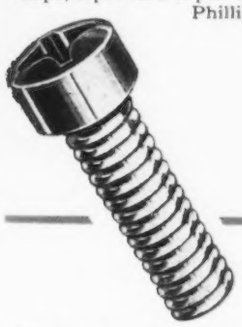
CAN'T LOOSEN

Easier-to-drive Phillips Screws set up flush without heads splitting. Greater resistance to vibration.



PRECISION FIT Stops Fumbling, Crooked Driving, Burrs

The Phillips Recessed Head Screw clings to the driver. The driver centers in the screw's recess, drives straight with one hand free to hold the work. Absence of shearing action means no burrs. Shape, taper and depth of the genuine Phillips recess were determined after months of research. The recess utilizes the driver's maximum turning power without sacrifice of strength in the screw head. Four sizes of Phillips Drivers give best efficiency over entire range of screw sizes. 2 driver sizes fit diameters #5 to #16 inclusive.



PHILLIPS

RECESSED HEAD SCREWS

MACHINE SCREWS · SHEET METAL SCREWS · WOOD SCREWS · STOVE BOLTS

THIS BOOKLET will help your plant to cut assembly costs 50% and more. Address one of the firms below for free copy.

U. S. Pat. on Product and Methods Nos. 2,046,348; 2,046,837; 2,046,839; 2,046,840; 2,082,085; 2,084,078; 2,084,079; 2,090,338

American Screw Co., Licensor, Providence, R. I.
Chandler Products Company, Euclid, Ohio
Continental Screw Co., New Bedford, Mass.
Corbin Screw Corporation, New Britain, Conn.
The Lamson & Sessions Co., Cleveland, Ohio
National Screw & Mfg. Co., Cleveland, Ohio
Parker-Kalon Corporation, New York, N. Y.
Pheoll Manufacturing Company, Chicago, Illinois
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N.Y.
Scovill Manufacturing Co., Waterbury, Conn.

IT COSTS LESS TO USE PHILLIPS SCREWS

NATIONAL STEEL HIGH TENSILE ALLOY

IS A High Tensile High-Ductile Steel

WITH UNUSUAL COLD-FORMING PROPERTIES

Difficult parts cold formed with National Steel High Tensile Alloy.

ITS INHERENTLY FINER GRAIN MAKES ALL THE DIFFERENCE

To the many desirable characteristics of high tensile steels National has added another—and perhaps the most important from a practical standpoint—DUCTILITY.

For the tough jobs—where high tensile properties must be combined with unusual ductility; for difficult applications where cold forming operations are too severe for ordinary high tensile steels—there you will find National Steel high tensile alloy meeting every requirement. For this steel, unlike other high tensile steels, can be cold formed readily into such difficult shapes as those shown here.

If you have a production or engineering problem that requires *ductility in addition to high strength*, National Steel high tensile alloy may be just what you are looking for. Our engineers will be glad to work with you in applying this HIGH-DUCTILE steel to your specific requirements.

National Steel high tensile alloy is available in sheets, strip, plates, bars and shapes.

NATIONAL STEEL

GREAT LAKES STEEL CORPORATION · DETROIT, MICHIGAN

DISTRICT OFFICES: ***Boston,*** **1001 Statler Building;** ***Buffalo,*** **1000 Walbridge Building;** ***Chattanooga,*** **Hamilton Bank Building;** ***Chicago,*** **1026 Builders Building;** ***Cleveland,*** **820 Leader Building;** ***Dayton,*** **846 Third National Bank Building;** ***Indianapolis,*** **1215-17 Circle Tower;** ***New York,*** **405 Lexington Avenue;** ***Philadelphia,*** **407 Liberty Trust Building;** ***St. Louis,*** **3615 Olive Street;** ***San Francisco,*** **824 Sharon Building;** ***Toledo,*** **906 Edison Building.**

DIVISION OF

NATIONAL STEEL CORPORATION

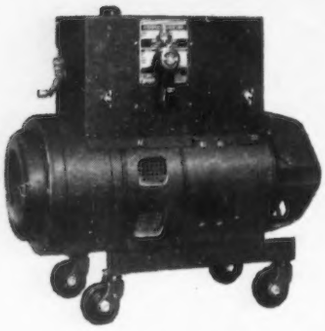
Corrosion in Wire Rope is like old-fashioned "Rhumatiz"

The bearings just don't work. Hence flexibility is lost and the extra bending load from this stiffness quickly destroys the individual wires. A corroded rope is a dangerous rope to use. If the wires of a rusty rope are still in good condition, the rope may be salvaged. A thorough treatment with a penetrating lubricant will free the bearing surfaces and permit the wires to slide by each other when the rope is flexed. But no amount of oil can replace worn surfaces. The best thing is . . . don't let your rope get "Rhumatiz". Wire Rope is made with proper oil impregnation of the hemp centers and ample slushing of the wires inside and out to assure proper lubrication during storage, marketing and initial use. Protect it by greasing the surface during use and enjoy the longest possible service from Wire Rope.

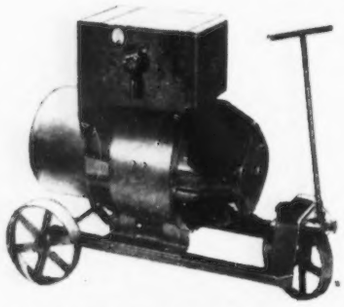
WICKWIRE ROPE

WICKWIRE SPENCER STEEL COMPANY

General Offices: 500 Fifth Avenue, New York City; Sales Offices and Warehouses: Worcester, New York, Chicago, Buffalo, San Francisco, Los Angeles, Tulsa, Chattanooga, Houston, Abilene, Texas, Seattle. Export Sales Department: New York City



150-amp d-c arc welder



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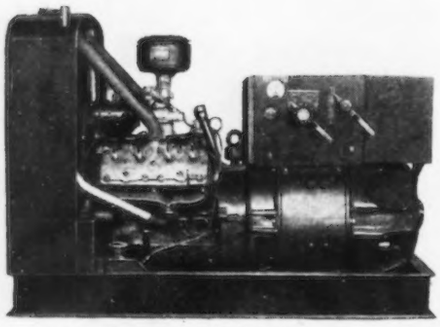

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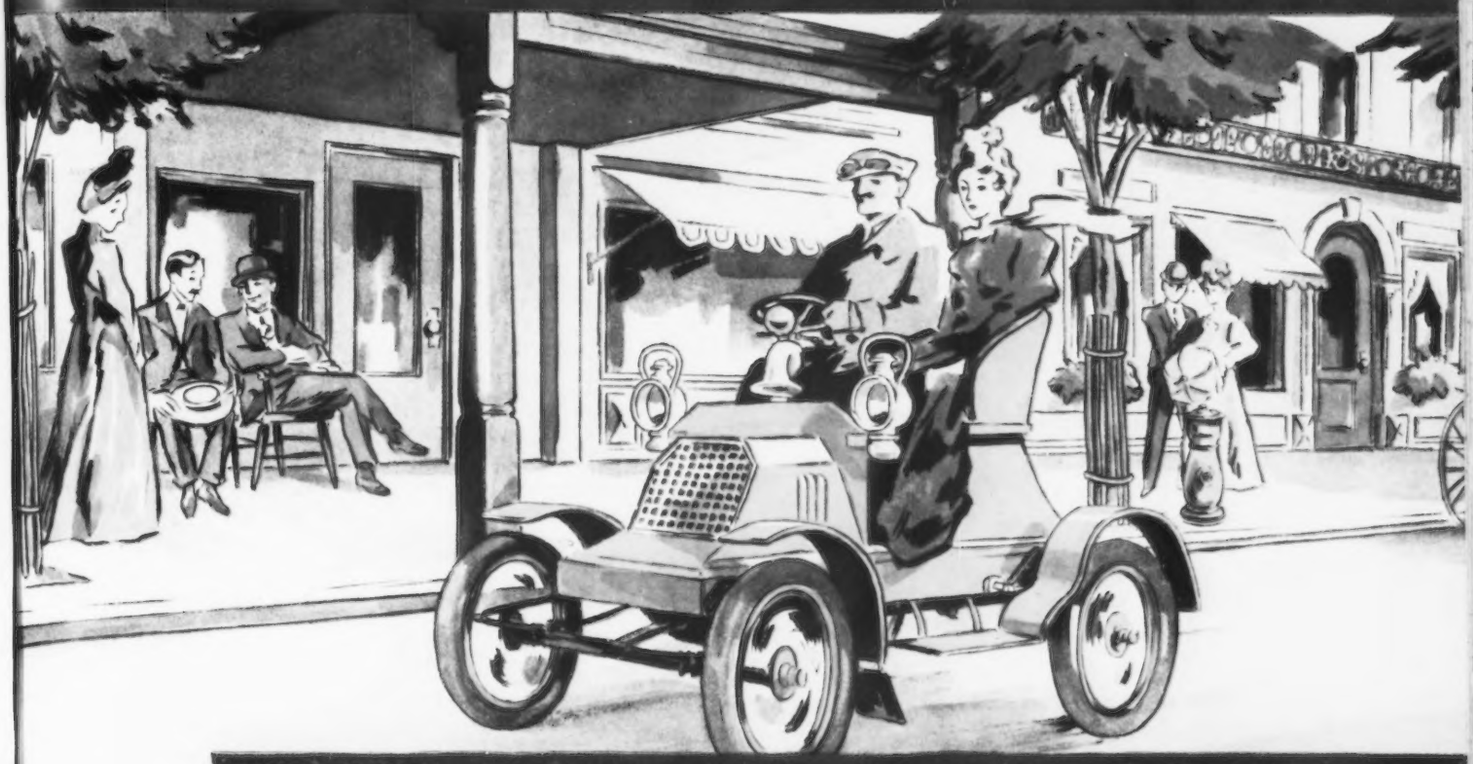

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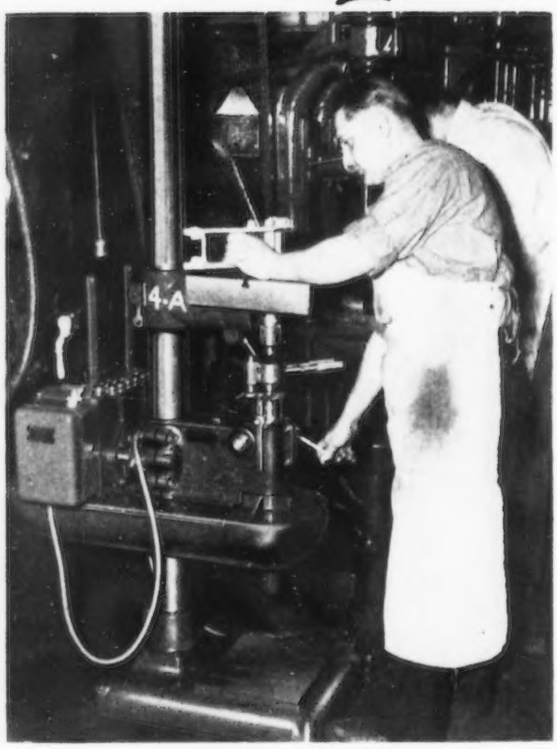

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Owned and Published by

CHILTON COMPANY
(Incorporated)

Publication Office
Chestnut and 56th Sts.,
Philadelphia, Pa.

Editorial and Executive Offices
239 West 39th St.,
New York, N. Y.

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Member, Audit Bureau of Circulations
Member Associated Business Papers
Indexed in the Industrial Arts Index.
Published every Thursday. Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 a year. Single copy, 25 cents. Cable Address, "Ironage, N. Y."

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THE IRON AGE

Contents

MAY 18, 1939

Threat to the Machine	11
A Job That Needs *Your* Help	63
Silence Gives Consent	65
German Metallurgical Problems	68
Leveling Peaks and Valleys in Power Boiler Plant	70
Indian Furnace Revamped	75
Chromium Plating Tractor Parts for Wear Resistance	76
Casing and Water Pit Trap Tumbler Dust	77
Metallurgical Aspects of Superfinish	78
Record Size Flywheels Weigh 95 Tons Each	80
Industry at the World's Fair	81
On the Assembly Line	90
Washington News	94
THE NEWS IN BRIEF	116
Weekly Ingot Operating Rate	122
Rate of Activity in Capital Goods	122
Plant Expansion and Equipment Buying	138

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Products Advertised	148
Just Between Us Two	149
Index to Advertisers	174

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STEEL CORPORATION
PITTSBURGH, PA.

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... THE IRON AGE ...

MAY 18, 1939

ESTABLISHED 1855

Vol. 143, No. 20

A Job That Needs YOUR Help

YOU have seen "The Threat to the Machine" which is the subject of the special editorial insert commencing on page 11. This is the first of six graphic presentations which will portray time-saving machinery in its true rôle as an employment creator. By the time that this series is completed, it will give sufficient factual proof to convince any reasonable man that the existing unemployment is not due to mechanization but to the fact that we have overbalanced and destroyed the machine's constructive time-savings by profligate squandering of the accumulated savings of past decades. And what is more important is that if we do not change the attitude of the public toward the machine and put a stop to efforts to further handicap it, we may well find ourselves, in a few years, back to the producing and consuming level of 1850, instead of at the level of 1899 to which we have now retrogressed since 1930.

It is important, we believe, that these facts shall be spread as widely as possible. We shall see that they are given as broad a distribution as we possibly can give them, through newspapers, through sending them to state and national legislators and to molders of public opinion everywhere. In simplified and more popular form, they will also be made available to millions who visit the New York World's Fair.

You can help to spread this much needed gospel. See that the leaders of thought in your community are put in possession of the facts. As announced on page 19, we are making reprints available which you can place where you think they will do the most good.

See that the editors and publishers of your local newspapers have these facts called to their attention by personal contact. Doubtless they will receive our press releases on this subject, but there is nothing more effective than the personal follow-up. On receipt of a request, we shall be glad to send you a copy of the condensed press release prepared for this purpose.

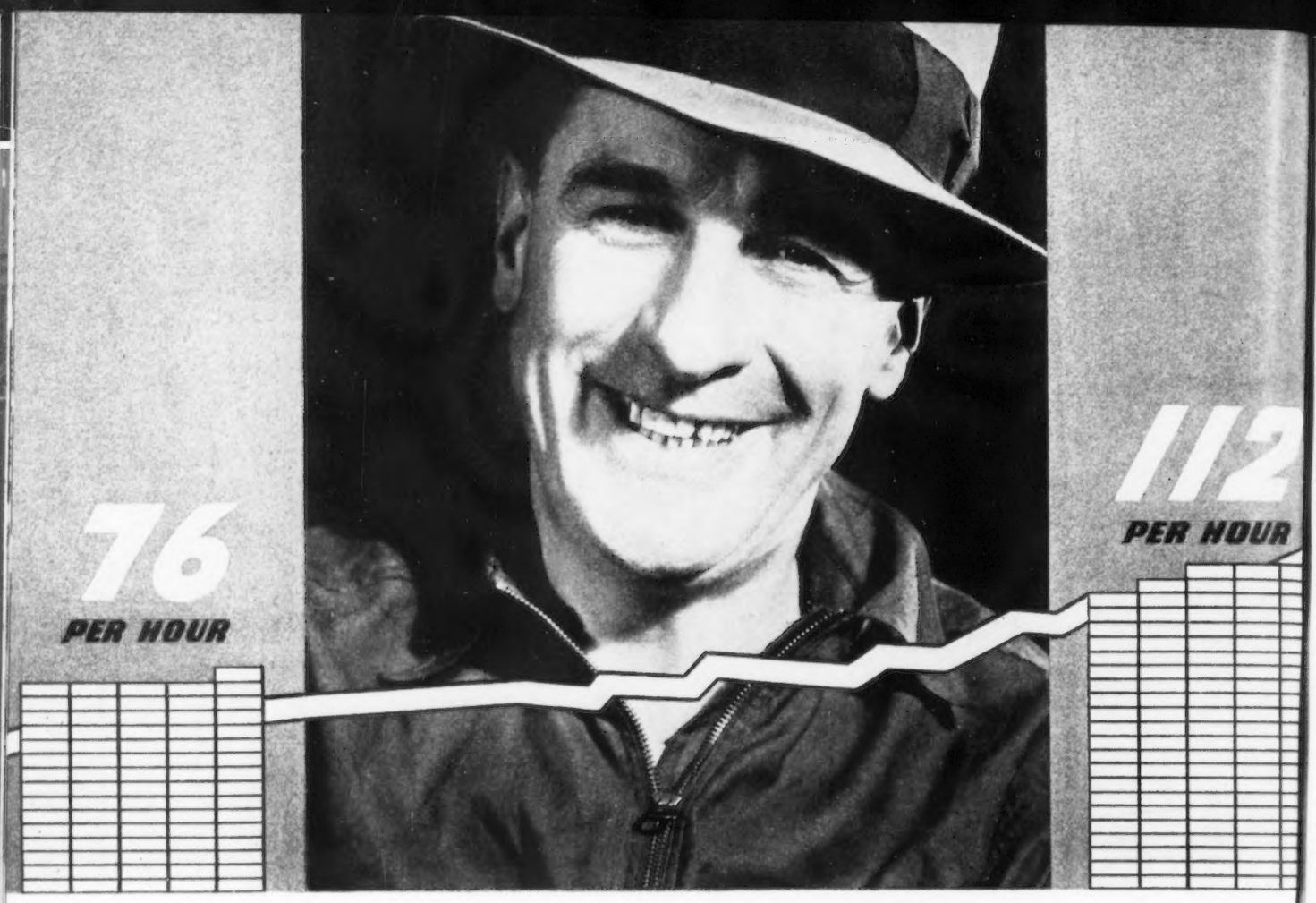
One more way in which you can help, and a big one. We are living in a machine age. What we have we owe to mechanization, very largely. To time-saving machinery. Your own products could not be made without them and sold at their price.

We should be proud of time-saving machinery in our plants; proud to call attention to the fact that we use it as widely as possible. Why not tell the public about it?

If you are a maker and seller of a nationally advertised product, we suggest that you run a line on every advertisement, put it on every circular and on each page of every catalog. A slogan reading

"Time-Saving Machines Made This Product.
Making This Product Made ..... Jobs."

Think of what that slogan, when associated with hundreds of products that are considered as indispensables, would mean to the public. And think of what the repetition of this thought, day after day in hundreds of places would do to public thinking with respect to machinery.



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Formerly, cold rolled SAE X-1315 was used, on an automatic lathe with spindle speed of 332 r.p.m. Production: 76 pieces per hour.

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With Inland Ledloy 1020-90, spindle speeds were stepped up to 407 r.p.m. Production: 112 pieces per hour.

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YOU CAN SAVE WITH LEDLOY

You can expect these same important savings in your own machining operations when you use Ledloy. Isn't it worth a trial order for test, to obtain these advantages:

- machining speeds increased 30% to 100%.
- tool life lengthened 50% to 200%.
- saving of several dollars—even up to $50 or more—per ton of steel machined.

Inland Ledloy is the original lead-bearing steel developed by Inland metallurgists, and announced to the industry in 1938. In each SAE analysis Ledloy possesses the same physical characteristics as ordinary steel—except for its better machinability and slightly reduced grain size.

A sensible step toward enjoying Ledloy money savings is to call Inland—or write for Inland Ledloy Bulletin (No.50.)

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LEAD-BEARING STEELS

INLAND PRODUCTS INCLUDE: *SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS*

Silence Gives Consent

By WENDELL E. WHIPP

President and General Manager, Monarch Machine Tool Co., Sidney, Ohio; President, National Machine Tool Builders' Association

THERE is an old proverb to the effect that "Silence gives consent." What does this have to do with the machine tool industry?

This industry along with industry in general, has for some time been under attack. Repeatedly the charge has been made that machines destroy jobs. Again and again the public has been told that employers buy new machinery and equipment in order that they may throw workmen out in the street and thereby reap higher profits.

Is there an answer to this sort of accusation? Of course there is an answer, and a good one. You and I know that mechanization leads always, in the long run, both to increased employment and to lower prices for the comforts and conveniences that raise the standard of living.

But what is industry doing to present this answer to the public? What in particular is the machine tool industry doing in this direction?

Unless a sound answer is adequately presented, we can not blame the public if it assumes that "silence gives consent."

o o o

Why should the machine tool industry worry about this situation? Machine tools are not sold to the public. They are sold to manufacturers.

Makers of machine tools are nevertheless vitally interested in this picture for two reasons:

First—machine tool builders have enough sales resistance to overcome, as it is. If the force of public opinion consistently resists further mechanization, this adds additional ammunition to the sales defense of the manufacturer who persistently says "no."

Second—and this is infinitely more important—sales resistance to the buying of machine tools is based largely upon lack of confidence in the future. Lack of confidence is based upon political and legislative uncertainty. Political and legislative uncertainty are based upon the beliefs and the attitudes of the people who vote.

If the voters of this country were convinced that progress in mechanization, including the replacement of obsolete tools by new and modern machine tool equipment, would aid in the solving of our social and economic problems, it is my firm conviction that public opinion would rapidly force vital changes in the Government's attitude toward business, and thereby foster confidence in the future which would promote the buying of machine tools.

It is impossible to separate the outlook for the machine tool industry from the current state of public opinion. As long as public opinion damns mechanization, we will have laws impeding mechanization and hesitation upon the part of prospective buyers. If we can sell the public on the fact that mechanization is, in the long run, conducive to the welfare of all the people, the shift in the wind would take place almost over night.

At this late date it is unnecessary

to review the many and complex reasons which contributed to the fact that mechanization has fallen into disrepute with the public. The important question is one of how mechanization can contrive once more to regain in the public mind the high favor in which it formerly stood.

In the last few years, American industry as a whole and many individual industries such as the machine tool industry have made strenuous efforts in this direction. It is my conviction that they have made very substantial progress. I have the highest regard, for instance, for the accomplishments of the National Association of Manufacturers along this line. The machine tool industry has likewise, within the limitations of its size and scope of operations, done much in this direction.

A Straight-Forward Story

The story told by the Machine Tool Builders as well as by the National Association of Manufacturers has been an honest and straight-forward story. Both have endeavored to set forth before the American public the facts that research, invention and mechanization, instead of leading to bloated profits and smaller employment, have led in fact to increased employment and to lower prices for the comforts and conveniences which measure the standard of living.

The machine tool industry in particular has had a remarkably effective story to tell in this respect. The net accomplishment of machine tools has been to make possible the production of better products at lower cost—with consequent increased employment.

And yet, for some reason, the story of industry as a whole, and of the machine tool industry in particular, does not yet seem to have captured the understanding of the general public.

It is quite true that the people of this country have today begun to question seriously the theories of social and economic reform which have so long been dangled before them by the theorists in Washington. Obviously these theories have not worked. The people today seem somewhat bewildered at their failure. They seem at last to have a general conception of the fact that their own personal prosperity is dependent upon the prosperity of business—but they still appear to be groping in the dark as to why. Business has not yet succeeded in getting over to the public the relationship between progressive mechanization and progressive prosperity.

What is the reason for this stale-

mate? Why is it, for instance, that the public is now beginning to admit, on the one hand, that business must go forward if all are to regain prosperity, and, on the other hand, still suspects that further mechanization and modernization mean further technological unemployment, and profits for the few at the expense of the many?

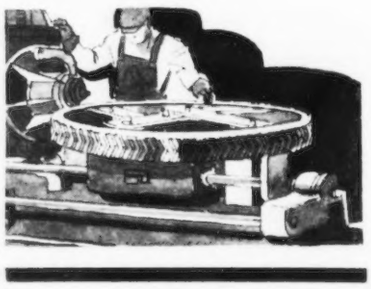
The only answer I can see is that business has failed to make plain the relationship between mechanization and the welfare of the individual citizen. People realize now that in order to have ample payrolls and prosperity we must have good business. But they do not yet understand that in order to have good business we must have progressive mechanization. They do not yet realize that research, invention and mechanization are not merely the parents of better standards of living, but are also the parents of lower prices and better wages.

What's Wrong Here?

What is wrong in this picture? Somehow industry has thus far failed to paint its portrait in such a way that all the people can understand.

In seeking for an explanation, I have come to the conclusion that the chief difficulty has lain in the fact that industry has assumed an extent of public knowledge and understanding which does not in fact exist.

The machine tool industry, for instance, has told the public repeatedly how machine tools have cut the prices of countless devices which add to



human comfort and in the long run increase the number of men employed.

But what is a machine tool?

How many people actually know what a machine tool is?

Just a couple of weeks ago a nationally known woman author visited the plant of a leading turret lathe manufacturer. The executive conducting her through the plant proudly pointed out to her the company's current line of machines.

"Are these the things you sell?" she asked. He nodded.

"But what in the world are they?" she queried.

"Turret lathes," he responded.

"Turret lathes?" she echoed, in a vague way. "Well what are they for, and what do they do?"

For some years past this woman has been writing, for national magazines, articles on the subject of employment, standard of living, and welfare of mankind.

And yet further discussion with this author revealed the fact that never in her entire life had she had the slightest comprehension of what a machine tool was, or what it did. She had never even had any conception of the significance of the principle of interchangeability of parts. The whole chapter of the function of machine tools in the American scheme of living had remained to her a closed book.

Not long ago I happened to get in a discussion with a man who for many years wrote the business reviews published by an outstanding midwestern bank. He confessed to me that the first time he undertook to write a review of the machine tool industry he thought that machine tools were tools used to keep machines in repair—such as monkey wrenches and screw drivers.

What's An Engine Lathe?

A short time ago a gentleman of my acquaintance was seeking to interest a representative of a national broadcasting company in the radio reporting of a news event of considerable importance to industry. In the course of discussion the term "engine lathes" came up.

"What in Sam Hill is an engine lathe?" said the broadcaster. "I never heard of it."

Not long ago a prominent banker had occasion to visit our own plant. In the course of his visit he confessed to me that in spite of the fact that his bank had for many years carried the accounts of various machine tool

builders, he never yet had been inside a machine tool plant.

Now, if national writers on social and economic affairs, bank reviewers, people who govern radio broadcasts, and practical bankers, do not know what a machine tool is or what it does—what can you expect of the general public?

Of course the thousands of men who work in our industrial plants know exactly what a machine tool is and what it does. But these people do not constitute the majority of our population.

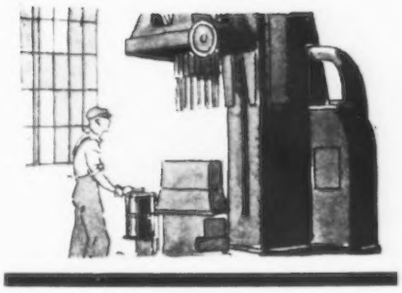
What about the professional men? What about the people engaged in retailing? What about the farmers? And more important than all these put together—what about the women who never get inside a factory, but who represent an all-powerful element in public opinion, and whose votes are just as important as are those of our entire male population?

What Weight Argument?

Are these people who know nothing about machine tools—who have not the slightest conception of what they are or what they do—in the least affected by the statement that machine tools make modern conveniences available to the public at lower prices, and over a period of time increase employment?

Such arguments do not reach these people, because they do not yet know what a machine tool is and what it does. The industry must explain that machine tools remove metal; that they remove metal in order to make the parts which are assembled into modern comforts and conveniences—and that without sufficient accuracy to permit interchangeability of parts and mass production, modern comforts and conveniences simply could not be given to the public at today's prices. With this finally made plain, the industry then could proceed to pound home the story of how prices of consumer products go down as productivity increases, and employment mounts as lower prices continue to attract a broader volume.

I must admit that if most of the public does not understand machine tools, the fault has lain largely with the machine tool industry itself. It is only natural that machine tool builders, selling only to manufacturers and not to the general public, should not hitherto have been particularly exercised over public education or public opinion.



Furthermore, a great deal of the terminology which has been employed by the machine tool industry has contributed to a faulty interpretation upon the part of the public.

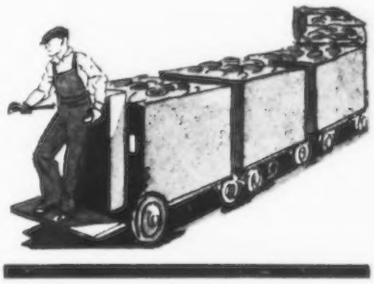
We have said that machine tools "cut labor costs." The assumption by the public has been that a manufacturer installs a machine tool which will do the work formerly done by men, and throws men out of employment. You know, and I know, that when we refer to "cutting labor costs" we are talking in terms of "labor cost per piece of product produced." In other words, if a manufacturer, through the use of machine tools, can cut the production costs of a product, he can likewise cut his selling price. By so doing he may increase his volume.

The fact is that in countless numbers of cases a manufacturer, by cutting his "labor costs," has actually been able to increase immediately his number of men employed. He has cut his production costs on his product—and thereby added to his market, his volume, and his employment.

Increased Productivity

But the phrase "cutting labor costs" is an unfortunate expression. What machine tool builders have to offer is "increased productivity per man employed." Another way of stating it is to say that machine tools can cut production costs and thereby cut selling price.

Of course in this process machine tools also add to profit. But I do not



believe for a moment that the American public will resent profits, if these profits are gained by a reduction in sales price, an increase in volume, and an increase in employment.

Machine tools have been known to the world as "labor-saving" devices. The phrase "labor-saving" has been given an unfortunate twist by so-called social reformers. The connotation of the phrase has been that men are fired and their places taken by machines.

I think it is time that not only machine tool builders, but all industrialists, should endeavor to present the phrase "labor-saving" to the American public in terms of its true meaning.

A "labor-saving" device is literally a device which saves labor. Machine tools constitute a perfect example. By the use of machine tools labor is performed which, in the old days, required literally the strain and sweat of thousands of workmen. Today machines do the hard work which formerly was done by men. All that men have to do today is to manipulate levers—the machines do the actual work.

It is not a simple or an easy proposition to present all of these facts and ideas effectively to the American public. In these days—with so many items clamoring for the attention of every reading and listening person, in the newspapers and on the radio—real effort must be brought to bear upon an educational program, if this program is to make any substantial dent upon public consciousness.

It is my hope, however, that the machine tool industry will place increased emphasis upon a permanent program of education of the American public. I think that the industry must make clear to the people of this country what a machine tool is; what it does; and why it is conducive to the progress and prosperity of mankind.

Concrete Proof Wanted

The people have had laid before them every possible sort of conflicting theory, every imaginable type of panacea, every conceivable plan pointing a way out of the wilderness.

From now on it seems to me any group which intends or expects to convince the American public of its way of thinking must advance clear-cut proofs in terms which any person can understand, and press these proofs upon the attention of a tired and bewildered public.

That, to my mind, is the major challenge before the machine tool industry today.

German METAL L

BY Paul Lindenberg

PHOSPHORUS and sulphur are, generally speaking, the nightmare of every iron metallurgist and blast furnace man considering that these elements will produce cold brittleness and red shortness when present in iron. During blast furnace operation, the pig iron absorbs sulphur in large quantities and therefore the desulphurizaton of pig iron, after tapping off and prior to its further working, is of the utmost importance.

Desulphurization is carried out in Germany by means of the sodium carbonate process, which yields a very low sulphur content in the pig iron, if so required. In practical operation, the most beneficial ratio has been found to be about 0.8 per cent of Na_2Co_3 to 0.1 per cent S. In order to obtain a thorough chemical reaction, a steady stream of sodium carbonate is poured on the liquid pig iron during the whole tapping procedure, a somewhat lower tapping temperature contributing to better desulphurization. The best time period for the chemical reaction is about 6 to 10 min., which should not be exceeded because of resulphurization danger. To keep down iron losses as much as possible, a carbon admixture in the amount of 20 per cent to the Na_2Co_3 quantity has given satisfactory results. This process has been improved considerably by the use of hot liquid sodium carbonate, which not only facilitates desulphurization but also considerably reduces heat losses during the reaction.

Desulphurization by the sodium carbonate process had its beginnings simultaneously in Germany and Great Britain, where it had been initiated by the well known firm of Brassert & Co.; in the meantime this process is making its way all over the Continent.

This particular method affords also another essential advantage: it fully eliminates the need for an extra addition of manganese ore (which Germany must purchase from abroad) to the burden mixture of the blast furnace, and thus accordingly does away with the monopolistic position of certain countries owning most of the world's manganese ore deposits —a rather interesting and desirable consequence of modern metallurgical achievement.

Sodium metasilicate likewise has a strong desulphurizing effect on pig iron, while an addition of lime to the metasilicate will considerably improve this effect in view of the fact that the lime combines with the silicic acid. Another desulphurization possibility results from an admixture of strontianite to the limestone flux, there being far better desulphurization during the smelting process in the blast furnace than would be possible with the limestone addition alone. In addition, there is brought about an improvement in the pig iron quality.

However, German low grade iron ores usually also contain a comparatively high amount of silicic acid, and this fact has compelled German metallurgists to discard customary blast furnace operation with abundant basic slags, which has been accepted the world over for nearly a century. It may be stated in this connection that in Germany the age-old blast furnace processes have been taken up again, when low grade ores with a Fe content of about 20 to 25 per cent and a high silicic acid content were worked profitably, notwithstanding the fact that the slag contains silicic acid to the extent of about 50 to 60 per cent.

The change-over to the smelting of acid iron ores, as well as slags of an entirely different nature, have brought forth quite a few new problems, as for instance reduction in heavy iron losses in slags with a high silicic acid percentage within the blast furnace. Furthermore, smelting of poor iron ores, and especially of those from the Salzgitter area, with a comparatively low phosphorous content, has led to the problem how to work successfully such pig iron without the admixture of phosphates or basic slags.

The only method for converting very large quantities of pig iron into steel at reasonably low costs is still the basic Bessemer process, and when steel is made from pig iron secured from low grade ores the refining in Bessemer converters, with the application of compressed air for the removal of detrimental components by oxidation, must be used also in the future. It is interesting to note that large-scale production on a continuous flow principle has now been developed, which makes use of a refining vessel designed in accordance with the latest practical experiences. This vessel converts pig iron into steel, the liquid pig iron being brought continuously to one end of the vessel and discharged in a refined state at its other end. This process, moreover, is said to yield the valuable element vanadium, a very important steel refining component, and one which ranks with manganese, tungsten, chrome, nickel, cobalt and molybdenum as an alloying element.

German Dogger ores and other ore deposits are said to contain fairly considerable percentages of vanadium, which can be recovered in sufficiently large amounts to substantially reduce the consumption of other steel refining materials. Further problems are: vanadium recuperation from basic Bessemer pig iron, the use of other manganese-containing ores instead of high-grade and expensive manganese, and the production of pig iron to contain but a small amount of manganese.

The scarcity of alloy metals in German mineral resources for steel refining materials has caused comprehensive researches into the effect of

various alloying elements on steel. Excellent results are said to have been obtained with regard to case hardened and annealed steels on the basis of alloys with a very low nickel content. Also, according to available reports, high-grade heat resisting steels are being produced without any admixture of nickel, while high speed steels are obtained with an insignificant percentage of tungsten or no tungsten at all, there being small additions of molybdenum and vanadium.

LURGICAL PROBLEMS

Duesseldorf, Germany

Another German metallurgical problem is the recovery of sulphur and zinc as by-products when working low grade ores with a poor lime and a high sulphur percentage and showing, moreover, some spelter.

The latest Four Year Plan makes compulsory the smelting of poor inland iron ores. This requirement has resulted in a drop of pig iron production estimated at about 30 per cent of the total output. This is not bearable from an economic point of view. The reason is obvious: bulky ore burdens with a small percentage of Fe had to be placed within a useful blast furnace space designed for normal operation and which evidently had become too restricted for the new kind of smelting process. Therefore, measures were taken which, in part, differ very much from former operating conditions in view of the poor iron and lime content of the ore requiring a far bulkier ore burden, with more limestone and higher coke consumption, besides the resulting large slag quantities, all of which meant an overload of the available furnace space. On the other hand, the troublesome fact had to be coped with that some inland ores tend to develop heavy dust formation within the furnace.

Comprehensive and large-scale practical tests have been carried out by German smelting and iron works in order to overcome all these difficulties. This work has resulted in the knowledge that prior to the smelting the raw ore must be submitted to a suitable dressing treatment consisting of roasting, sintering or calcining. There is obtained thereby a considerable saving in coke and limestone consumption, with reduced dust formation in the blast furnace, and an improvement at the same time in the Fe content. It has thus become possible to increase output and keep down production costs. Another auxiliary to this result was the application of oxygenated blast air, i.e., air with an added oxygen volume, and this has also contributed to reduce coke consumption and to increase output. It is said that with this method there is a saving of about 18 to 20 per cent in coke, as compared with normal blast air operation, and the furnace output is stated to have been enhanced by some 45 to 50 per cent. The preliminary dressing and burnt lime admixture apply also to the Salzgitter ores, and has lowered their smelting costs accordingly.

The fuel saving problem has led to an intensified utilization of blast furnace gases for the aforementioned dressing work, the gases accruing in huge quantities from inland ore smelting. Operating data from several lime kilns fired with these blast furnace gases have shown that the lime thus burnt is fully suitable for smelting purposes, affording even certain metallurgical advantages, as for instance reduction in sodium carbonate consumption for desulphurization.

The useful disposal of the increasing slag accumulations as a result of the forcibly stepped-up poor inland ore smelting confronted German metallurgists with yet another problem. Slags from acid smelting have been found to be suitable for the making of paving stones and the slag originating with sodium carbonate desulphurization may be used in glass production. Furthermore, it seems that the blast furnace foam slag will yield a convenient material for structural concrete and for lime fertilizers. According to Salzgitter ore smelting tests, mixed slags, i.e., a mixture of acid and basic slag, has turned out to be a valuable road construction material, while granulation tests of acid slag are said to have given quite satisfactory results.

In most countries with rich iron ore deposits, steel production is considerably higher than pig iron output in view of the fact that steel-works are using scrap for their furnace charges in rather large quantities, along with pig iron. Scrap in Germany averaged during the past few years about 60 to 65 per cent of the iron yield from smelted ores. With technical development progressing apace, the demand for iron and steel will increase accordingly and consequently the importance of scrap will be enhanced as a keen competitor to iron ore. Only that quantity of iron and steel which is entirely destroyed by atmospheric corrosion and oxidation should be considered as a total loss to national economy. Therefore, energy is directed toward the production of rust-proof and corrosion resisting grades of iron and steel—at a reasonable market price—another nut to crack for metallurgists in Germany and abroad.

Mining engineering is still constantly being called upon in Germany to increase to the utmost iron ore extraction at lowest possible costs, and dressing engineers are busy discovering the best and least expensive procedure to furnish suitable smelting ore. These are a few of the most urgent problems actually prevailing in the metallurgic activities of Germany, but many other problems exist which cannot be considered at the present time.

Leveling Production Peaks AND VALLEYS

By H. S. CARD

ANOTHER check for roundness is made when the welding of the drum is complete. Now the drum is ready for X-ray inspection of all the welds. The X-ray apparatus, which has capacity to exp'ore 4¼ in. of steel, is located beneath the floor in a lead lined room, where it is both perfectly safe and out of the way. The welded drum is brought by overhead crane and placed on trucks (Fig. 7) which carry the longitudinal weld over the tube in successive steps and allow the girth welds to be rotated over it in like manner. The two inspection trucks are equipped with adjustable trunnions to provide a holding arrangement that is flexible enough to handle every size of vessel that has to be inspected. Portable lead lined screens are set up during the inspection as a precaution against exposing workers to any stray radiation. Films are developed immediately in a darkroom on the ground floor, then taken to another room where the inspector can examine them in the shadow box. A separate office, fully equipped even to telephone service, is also maintained for use of inspectors not employed by the company.

Any defects that are located by the X-ray inspection have to be chipped out and the area rewelded, dressed, and X-rayed a second time.

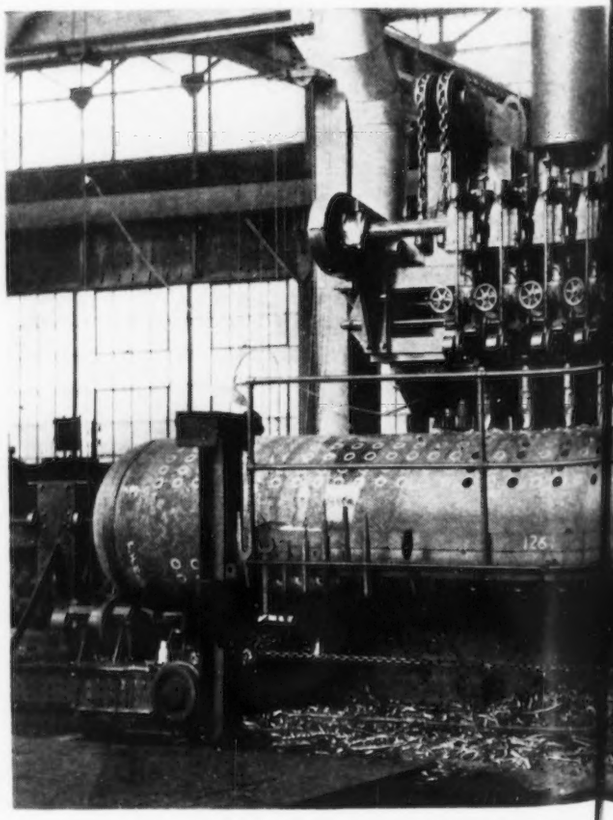
Nozzles Welded In by Hand

Following the final X-ray examination all nozzles are welded in by hand. This part of the welding is delegated to operators who have demonstrated great skill and dependability. Their work is not subject to radiographic examination, but it is carefully checked for correctness of contour and evidence of soundness of the deposit.

For stress relieving there is a large heat-treating furnace, built outside but opening from the shop. This furnace is of the car bottom type with steel cased walls, lined with insulating firebrick. It is oil fired, with ten burners on each side, the temperature of each side being controlled with Leeds and Northrup recording pyrometers connected to thermocouples inside the furnace. Inside temperature can be brought up to 2000 deg. F. in from 2 to 2½ hr. This is higher than the temperatures required for stress relief, but there is frequent need for it in the heat treatment of welded structures and vessels made of heat or corrosion resisting alloy steels. Stress relieving procedures are, of course, in accordance with the governing codes or specifications.

The testing room has facilities for testing with liquid pressures up to 5000 lb. per sq. in. and with air pressures up to 1200 lb. In the case of some of the equipment produced by the fabricating division, the elaborate facilities for forming metal and the complete-

FIG. 8—Eight-spindle gang drill employed for cutting tube holes up directly above it, the reaming



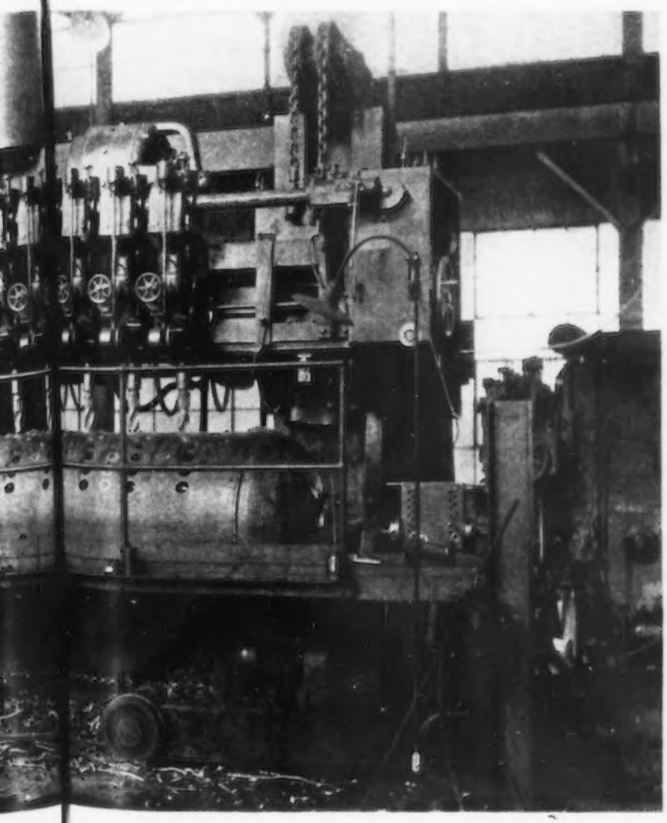
IN THE IRON AGE of April 13, page 42, Mr. Card outlined the nature of the Edge Moor production problem and illustrated the flow of work in connection with the construction of welded drums for a boiler of current type, from initial plate inspection to automatic welding by the Unionmelt process.

Here he gives data on X-ray examination, stress relieving and other steps, and also describes some of the special manufacturing requirements, notably in connection with a stainless steel drum. Finally, he outlines the production control system devised to prevent traffic jams at various points of the shop.

IN A POWER BOILER PLANT PART II

ness of the machine shop make it possible to assemble processing machinery in its entirety and to give it running tests under service conditions here on the testing floor before shipment to the user.

to 4 in. in diameter. As the reaming tool is integral with the drill and is done without changing of tools.



From the hydrostatic test the drum moves back to a bay adjoining the layout floor, where tube holes are drilled with an eight-spindle drilling machine (Fig. 8) using a combination tool that drills and reams holes up to 4 in. in diameter in one operation. Alongside this big machine there is a five-spindle unit for drilling headers.

The tubes are cut to length and bent to shape in another bay. Bending is done cold, over a mandrel. Workmanship here is under watchful control, since the tube shapes are customarily bent to order, and each set-up and procedure has to be carefully checked to be sure that bends are made without wrinkling or loss of roundness.

Only brief mention need be made of work-handling equipment in the shop. The fact that cylindrical shapes predominate in the orders makes it a simple matter to mount nearly all of the work on rollers for welding, so that it can all be done in the downhand position. A good supply of these rollers (Fig. 9) in assorted sizes has been accumulated. Overhead cranes are utilized when necessary for turning very heavy work.

Variety of Pressure Vessels and Processing Equipment

The above description of the routine which the high pressure boiler drum follows through the shop has passed by a few important pieces of machinery and some operations that are required in the work of the fabricating division. Pressure vessels and processing equipment go through in a much greater variety of shapes and sizes than boilers, and often have more intricate interior working parts as well as exterior structures. All of the commercial alloys are encountered and the welding involved is a combination of all joint types. Twenty-five single-operator arc welding generators take care of this part of the job. A plate heating furnace with pyrometric temperature control, a forging hammer and a powerful hydraulic press are available for special plate forming. A 12-ft. Chicago all-steel press brake takes care of the straight-line bending on the lighter plate, and an angle bender forms the numerous bottom rings needed for tanks.

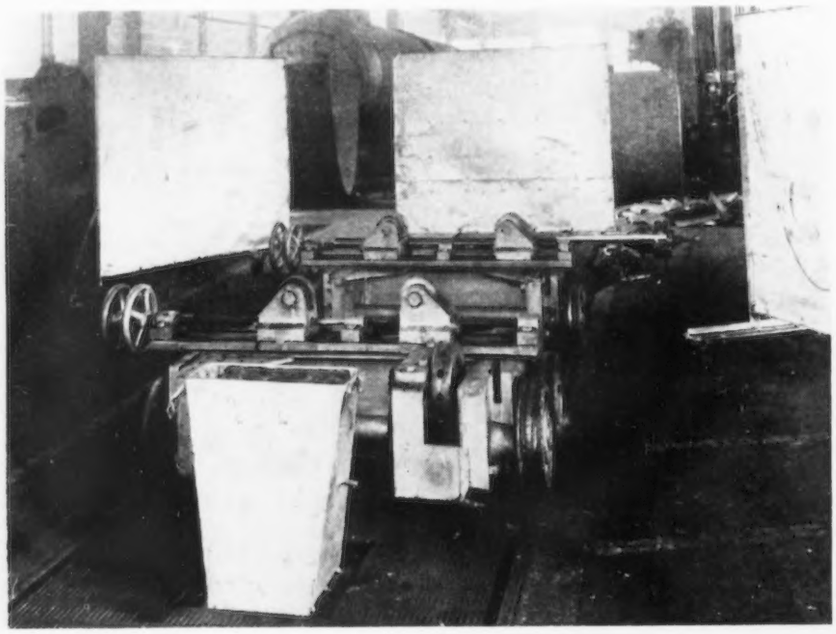
Customer specifications can sometimes make the well-known codes sound like simple rules. A very good example, which has been handled successfully at Edge Moor, is an order for food processing equipment involving stainless steel (18-8) dryer drums, Fig. 10. Shells for these drums were 60 in. in diameter and 10 ft. long, of

15/16-in. plate. Specifications called for grinding and polishing this drum to a tolerance of 0.005 in. for its entire length. The smaller stainless steel roll above it was ordered ground and polished to a tolerance of 0.002 in.

Since there were a number of these machines to be made, it was deemed expedient to make some careful preliminary tests of the electrode to be used and of the operators who were to weld the longitudinal seams. It is obvious that there could be no tolerance whatever in the matter of porosity.

The shell was rolled cold to a tolerance of 0.0625 in. then tacked, and arc welded from both sides. The weld was given a thorough X-ray inspection and any portion which showed even a suspicion of porosity was chipped out, rewelded and X-rayed again. The shell was next heat treated at 2000 deg. F. for one hr. Steel heads were then welded in and the complete drum given a hydrostatic test.

Having satisfied all test requirements, the drum was turned to size on the 84-in. swing, 42-ft. bed lathe pictured in Fig. 11, then ground and polished. Some degree of sagging of its own weight is to be expected in a structure of this size, and in addition the plate material has a much higher coefficient of thermal expansion than steel. Since the dryer drum when in service is filled with steam under pressure, if it were absolutely true to dimension when cold it would be out of true very soon after it was put to work. It was therefore necessary to do all the finishing under working conditions of heat and pressure. There are enough special problems involved



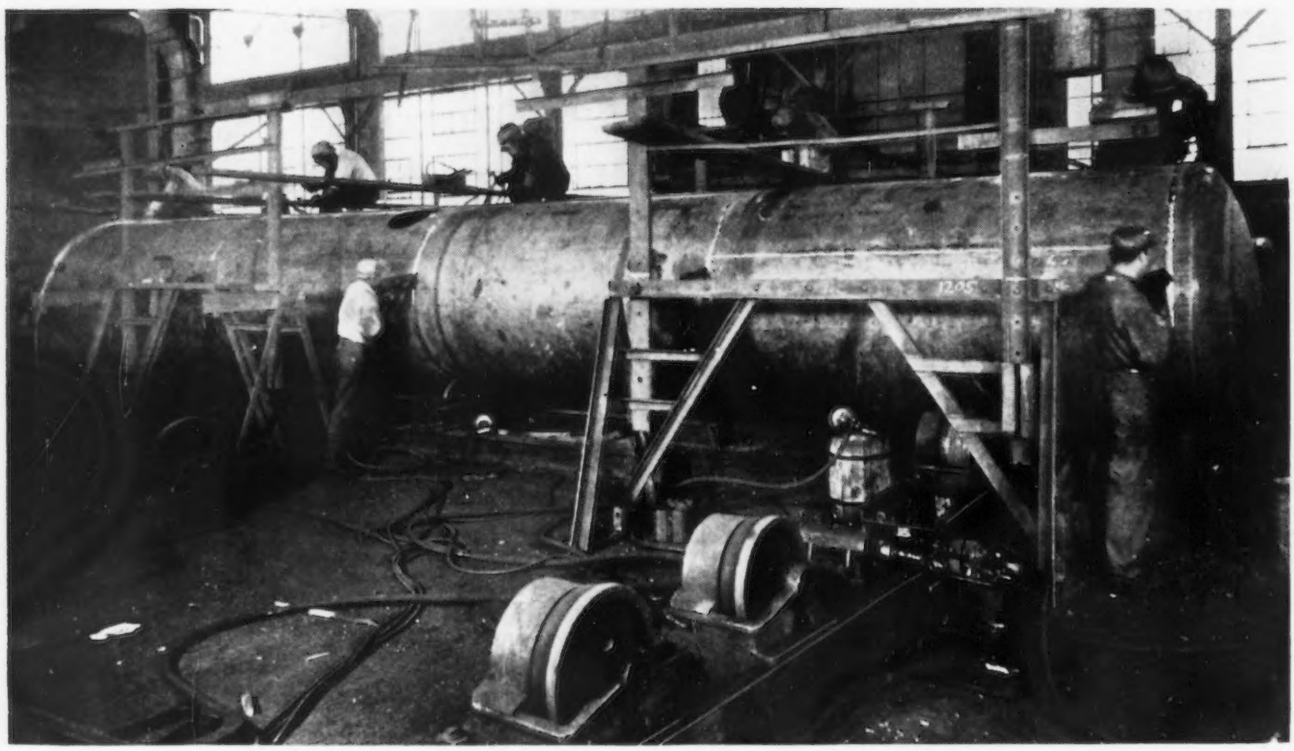
AT LEFT

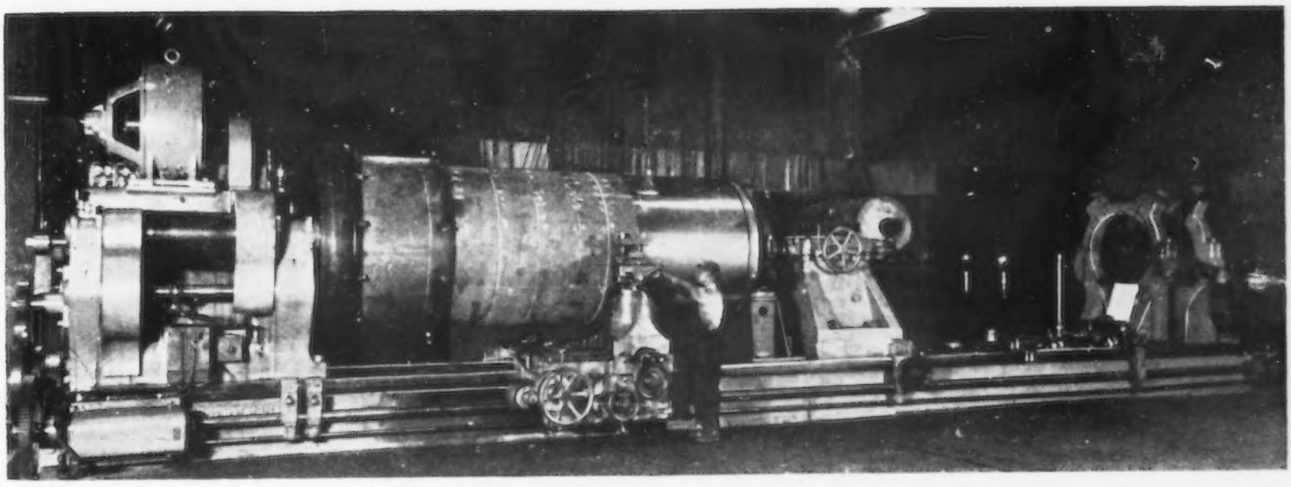
FIG. 7—X-ray exposure cone and the trucks on which vessels are mounted for radiographic inspection. The rollers are carried in adjustable trunnions so that they can be spread for more solidly mounting the larger vessels.

o o o

BELOW

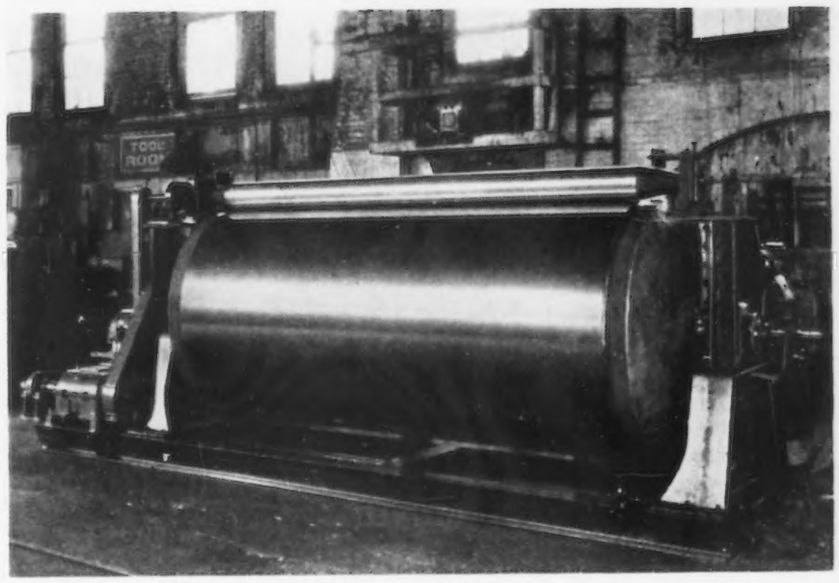
FIG. 9—One of the larger sets of rollers used for mounting cylindrical work is shown in the foreground of this view of the manual welding of a large pressure vessel.





ABOVE

FIG. 11 — Set-up for turning the stainless dryer drum pictured in Fig. 10. All machining, including grinding and polishing, had to be done under service conditions of heat and pressure in order to meet the required tolerances.



AT RIGHT

FIG. 10—Weld-fabricated stainless steel (18-8) dryer drum. The shells for these drums are made from 15 16-in. plate and are 60 in. in diameter and 10 ft. long. Specifications called for grinding and polishing to a tolerance of 0.005 in. for the entire length.

in this job to illustrate what was said in the introductory paragraphs regarding facilities for fabricating to meet exacting specifications. Furthermore, it is demonstrated here that welded construction is perfectly feasible under all requirements as to precision.

Some of the smaller and simpler structures incidental to the larger assemblies are housings, pedestals, screw conveyors and mixing mechanisms. One order for food cookers included heating coils made of 1-in. I.D. pipe. To cut out the ends of the vertical members of this coil and get a machine fit might be a somewhat expensive operation. At Edge Moor the pipe is held in a simple fixture and drilled apart with a drill of the same size as the outside diameter of the pipe—a perfect job in one operation. This is one of hundreds of instances where it has been advantageous to have access to machinery which is not ordinarily thought of in connection with welded fabrication.

Schedule Board Prevents Production Jams

Having in mind this multiplicity of operations and the fact that orders originate in two different departments, which in turn receive their orders from a wide diversity of industries, it is interesting to note the system of control devised to prevent the formation of traffic jams at various points in the shop. At the heart of it is an ingenious form of production schedule that keeps a picture of the work situation constantly before the superintendent.

The production schedule is a "board" 8 ft. long and 4 ft. high, divided into quarter-inch horizontal grooves by small metal strips (Fig. 12). Steel blocks, 2 x ¼ in., inserted in the grooves at the left edge, carry the names of all operations that are possible in the shop. Altogether there are 88 operations to be watched. Some of them have to be repeated several times on the board because they occur in greater volume than the others. Along the top groove are steel blocks, 1 x ¼ in., bearing numbers corresponding to the work days of the month. Steel blocks of the same size, differently colored, are used to schedule the work. When an order comes in it is assigned a color and blocks of that color are set in the grooves to show on what date each operation of that order is expected to be in progress.

For example, if the job color is red, and if the estimator has designated that it be flame cut and edge planed on the third of the month, and rolled on the 89-in. roll on the sixth, red blocks will be placed in the "Flame Cut" and "Plate Planer" grooves under the block numbered 3; and in the

"89-in. Roll" groove under the block numbered 6; and so on through to the shipping date, the last operating groove on the board being marked "Load." Since the operations are listed from top to bottom in the normal order in which they would generally be done in the shop, the flow of one job can be traced as a more or less regular band of color slanting downward to the right. There is enough space on the board to permit the scheduling of work for three months if it is desired.

The production schedule enables the estimators to avoid delivery promises that cannot be met or that would overcrowd the capacity of one department or of one machine. It enables the superintendent to tell at a glance when and how much any job is getting behind, and what other jobs may be affected by the delay. It indicates departments for which more work is desirable, and does this several weeks ahead of their slack periods. It cannot entirely level out the peaks and valleys, but it is a very useful means toward that end in the whole production plan.

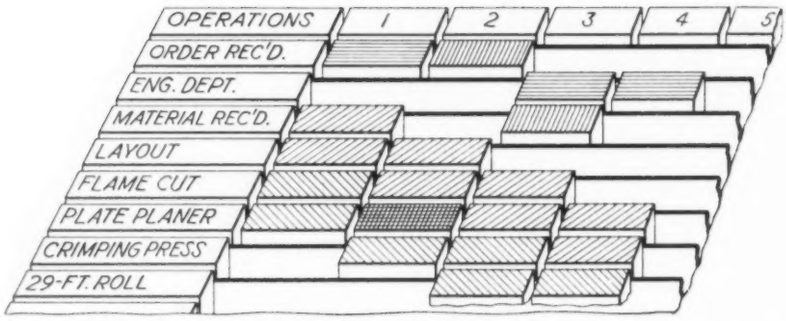


FIG. 12—Section of production scheduling board designed to assure smooth flow of work. Steel blocks of various colors are inserted into horizontal grooves. Those at the extreme left carry the names of all operations and those at the top designate the work days in the month. When an order is received it is assigned a color and blocks of that color are set in the grooves to show on what days successive operations are to be performed. Thus the flow of a job can be traced as a more or less regular band of color slanting downward to the right.

Inconel Now Used for Photographic Equipment

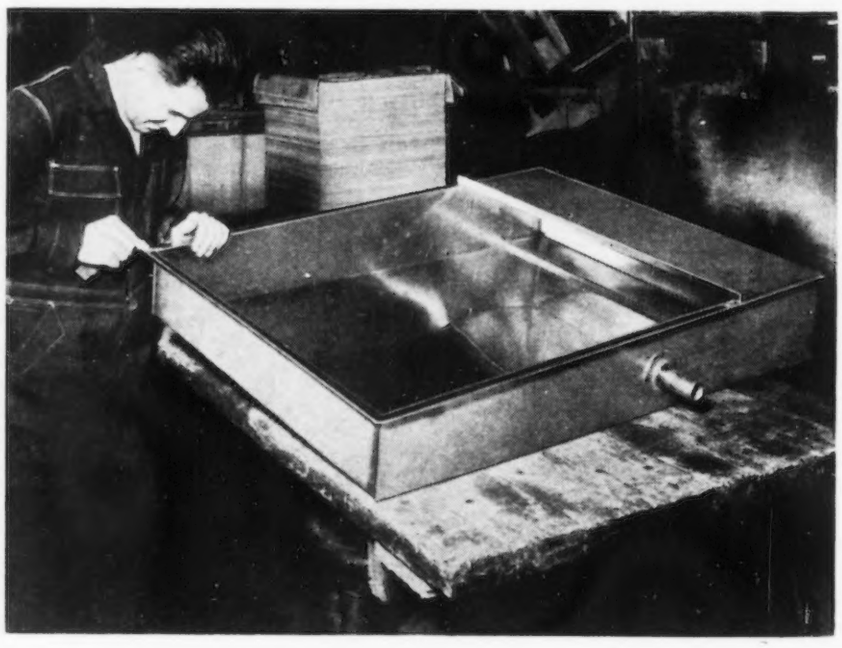
BECAUSE of the effect which most metals have on the highly corrosive chemicals involved in developing photographs, enameled ware or hard rubber have been used largely for equipment. The enamel sometimes has a tendency to chip or wear off, thus exposing the base metal. Hard rubber is breakable and otherwise lacks the mechanical properties of metal. Also, its color makes more difficult the inspection of film and of solution. With jacketed trays the lower heat transfer properties of hard rubber are less efficient than metal in the control of developing and fixing bath temperatures.

The value of Inconel for such applications as developing trays, spindles and guides on developing machines, tanks for hypo and hardening baths, and many others has been checked on a number of occasions. In one case an Inconel specimen exposed in X-ray developer showed no apparent corrosion after six weeks continuous contact. Other specimens tested in MQ and pyro-soda developers over ten months showed Inconel to be almost completely immune to attack.

Among other interesting applications for Inconel in photographic laboratories are pump linings, pipe, and connections for handling hypo solutions, parts of motion picture development apparatus, portable developing units for aerial survey work, and silver-nitrate baths used in connection with the sensitizing of glass plates for wet-plate photography.

The accompanying photograph shows a rocker type Inconel silver-nitrate bath under construction at the Fuhro Co., New York. The metal is 20 gage and is welded throughout.

Inconel contains approximately 80 per cent nickel, 14 per cent chromium and 6 per cent iron. It is available in all commercial mill forms, and can be fabricated by welding, soldering, and other common methods.



Indian Furnace REVAMPED

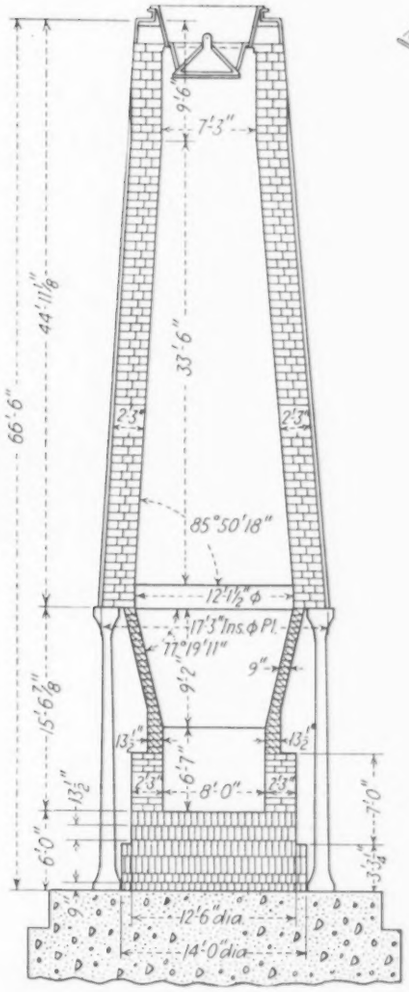


FIG. 1

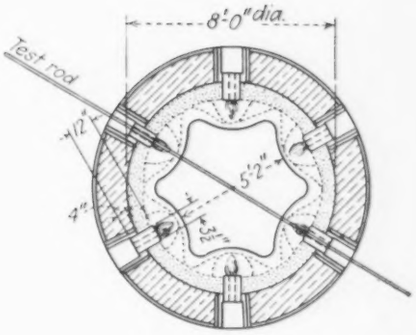


FIG. 2

Action with 12 x 3½ in. tuyeres while blowing 63 revolutions.

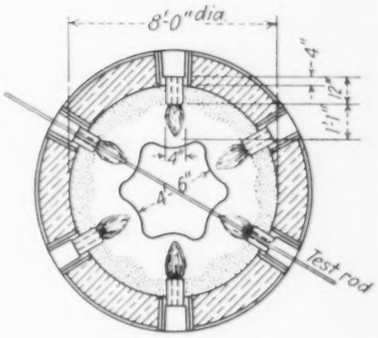


FIG. 3

Action with 12 x 4 in. tuyeres while blowing 70 revolutions.

IN this day of 1000-ton blast furnaces, the small charcoal furnace has been almost forgotten. However, many such units over the world continue to operate, turning out a high grade product. Of interest, therefore, are recent changes in size and alinement of tuyeres to improve the performance of a charcoal blast furnace of the Mysore Iron & Steel Works, Bhadravati, India.

According to H. V. R. Iyengar, superintendent of blast furnaces, the Bhadravati stack has been designed for a rated output of 80 tons per day. The furnace lines are shown in Fig. 1. There are six tuyeres 12 in. long and 3½ in. or 4 in. in diameter. Because of depressed market conditions the smaller tuyeres were employed until the last relining, on Aug. 22, 1938, with a blast volume of 5922 cu. ft. of air per min., equivalent to 63 r.p.m. of the blowing engine. The average production of the furnace was 70 to 75 tons per day of basic pig iron.

During the last relining, completed in August, 1938, the tuyere center and the stack center (there was a difference of 4½ in.) were brought into alinement by adjusting the difference in the thickness of the lining. The performance of the furnace with 12 x 3½ in. tuyere was better and the average production reached 85 tons, due to more uniform stock and blast distribution which enabled the furnace to carry a heavy burden. The penetration tests showed that the furnace was working hot on the sides and was colder at the center (see fig. 2).

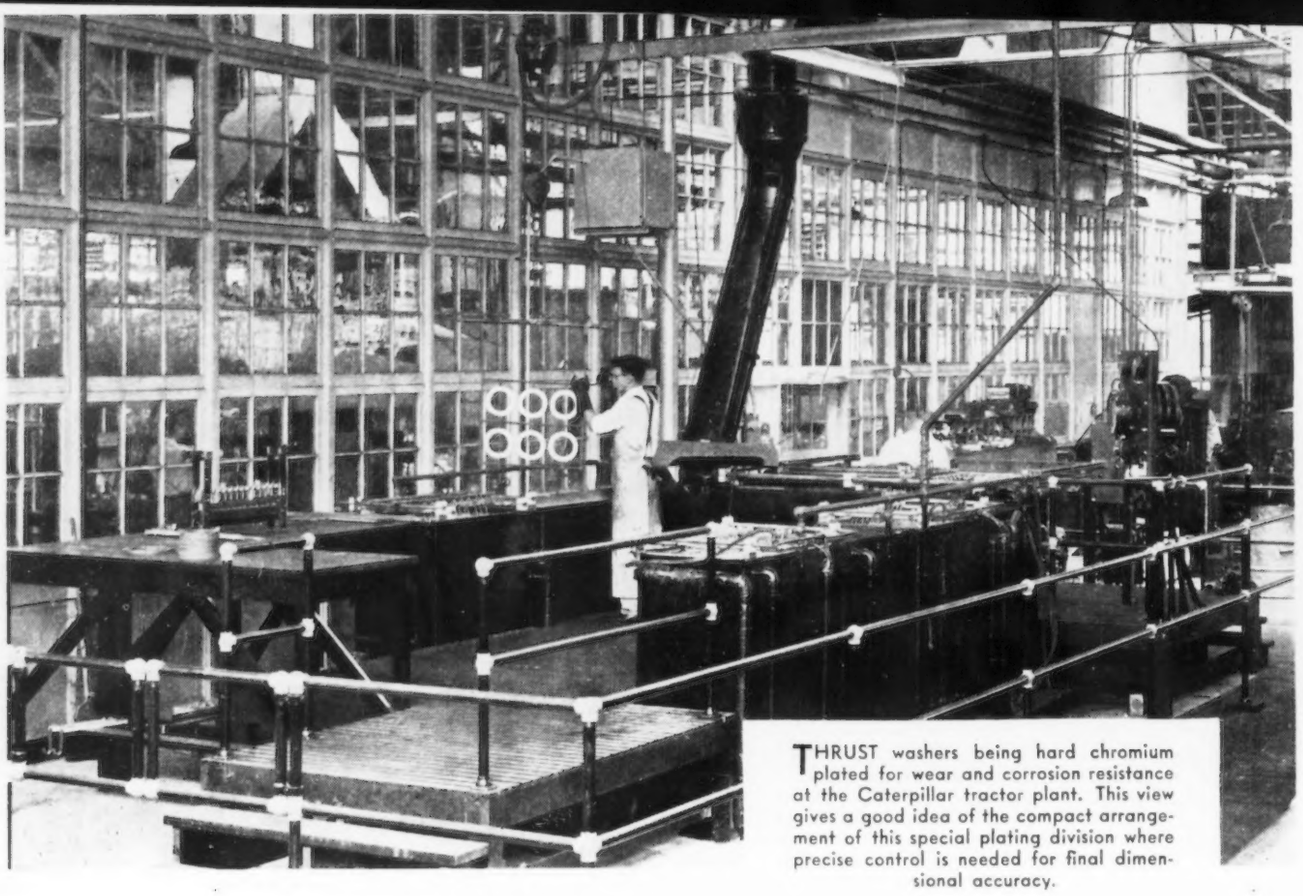
Following a trade revival, demand for pig iron increased, and it was decided to attempt a larger output. Bigger tuyeres 12 x 4 in. were fitted and the blast volume increased to 6298 cu. ft. per min., equivalent to 67 r.p.m. This increase in the tuyere area showed immediate improvements, and the average output increased to 88 tons per day. Penetration tests showed a better distribution of blast in the hearth area (see fig. 3). After a couple of months the blast volume increased to 6580 cu. ft. per min., equivalent to 70 r.p.m., and the average daily output increased to 100 tons per day.

The charcoal ratio per ton of iron has also been considerably reduced, and the average varies from 0.7 to 0.8 tons for basic grades and 0.90 to 1.0 for scotch and high-silicon grades.

Improved performance, both with respect to output and better charcoal ratio, appears to be due to (1) alinement of tuyeres and stack centers, and (2) better distribution of blast following the increased tuyere area and increased blast volume.

The pig iron is low in phosphorus and by the use of the low-phosphorus pig iron in the basic open-hearth furnace the basic slag also is low in phosphorus content. The open hearth slag is therefore charged back to the blast furnace and this has displaced limestone, manganese ores and siliceous iron ore from the furnace burden. Thus, the cost of pig iron has been considerably reduced. As some of the pig iron is sold out as such and some cast into cast iron pipe, the re-use of the basic open hearth slag is not expected to substantially increase the phosphorus in the pig.

For a year, the production of pig iron is 25,000 tons, of which 7000 tons is sold, 10,000 tons cast into pipe and 8000 tons used in basic open hearths.



THRUST washers being hard chromium plated for wear and corrosion resistance at the Caterpillar tractor plant. This view gives a good idea of the compact arrangement of this special plating division where precise control is needed for final dimensional accuracy.

Caterpillar Chromium Plates Engine Parts for Wear Resistance

HARD chromium plating, sometimes called industrial chromium plating, differs from ornamental chromium plating in that a much heavier plate is deposited directly on the steel part, usually to a thickness in excess of 0.0005 in., to produce a surface that is extremely resistant to certain types of wear and corrosion to which the part may be subjected in service.

Certain tractor parts, such as pump shafts, washers and plungers, are chromium plated by the Caterpillar Tractor Co., Peoria, Ill., for resistance to wear and corrosion. These parts are heat-treated prior to plating to produce the strength and hardness required and to adequately "back up" the deposited chromium. The plate thickness specified is between 0.00075 and 0.0015 in., depending upon the service applications of the parts, and since the parts are plated to size with no subsequent grinding, very precise control of plating conditions and operations is necessary to attain the close limits of accuracy required for the finished size of the parts. The chromium plating operations at Caterpillar are conducted under a license under the patents owned by United Chromium, Inc.

The plating bath used is a chromic acid-sulphate solution with 33 oz. per gal. chromic acid and 0.33 oz. per gal. sulphate (ratio 100:1), and is closely maintained by daily chemical analyses and adjustments. Temperature of the solution is maintained at 131 deg. F. by a recorder controller. Since these factors are fixed, the remaining variables, current density and plating time, are carefully co-ordinated to produce the required thickness of plate on the parts.

The parts to be plated are mounted in suitably designed work racks. Keys are inserted in keyways and pins in drilled holes requiring protection against plating. Special lacquer-coated collars or shields are used also to protect portions of some shafts against plating. The sequence of operations in the process of plating is as follows:

1. Electro clean in an alkali solution (8-10 oz. per gal.) at 180-200 deg. F., the work being cathodic. This treatment produces a grease-free surface for plating.

2. Rinse off alkali solution in running cold water.

3. Etch in sulphuric acid. This produces an oxide-free etched surface upon which a strongly adherent chromium plate can be deposited.

4. Rinse off the acid in running cold water.

5. Chromium plate. Current density and time of plating regulated as required to produce the specified thickness of plate on the parts. Flat anodes are used when plating washers or other flat parts. Tubular shaped conforming anodes are used for plating uniformly on shafts and plungers and these are built in as a part of the racks for such parts. All anodes are made of an alloy of lead.

6. Rinse in still water. The chromic acid contamination in this rinse water is salvaged by using this water for replacement of the evaporation loss in the plating bath when required.

7. Hot water rinse and dry.

8. Remove the parts from rack and inspect.

Copper sulphate immersion tests are frequently made on the parts to check for adequate coverage.

Casing and Water Pit Trap Tumbler Dust

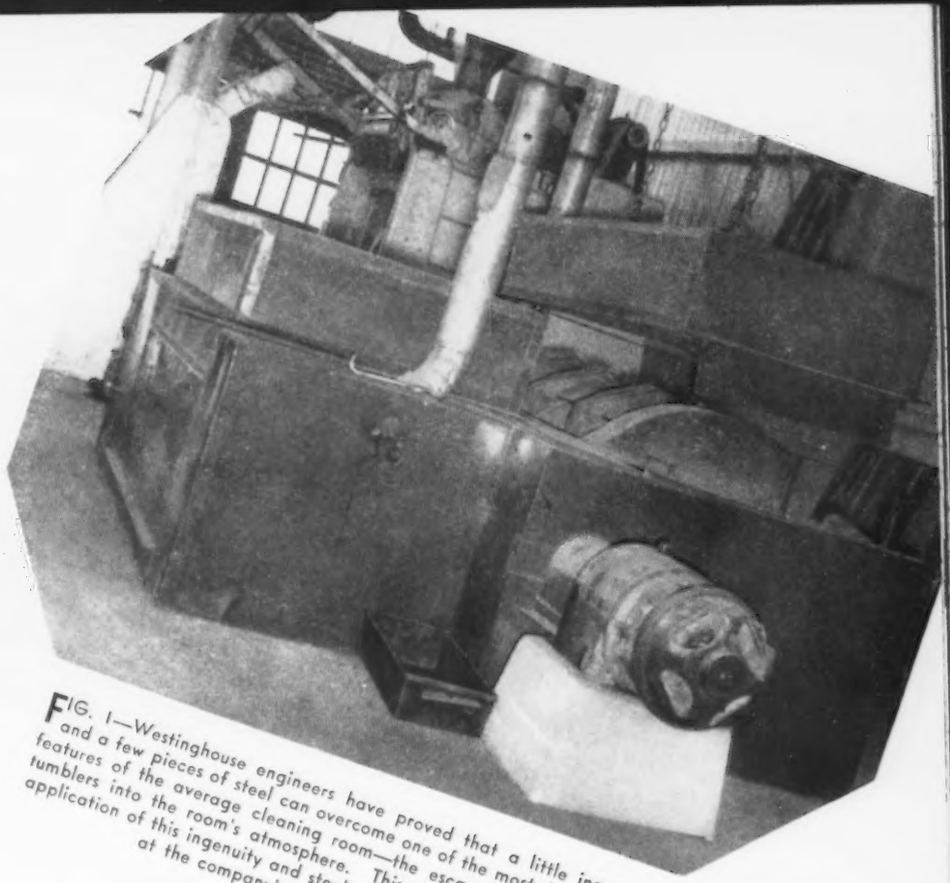


FIG. 1—Westinghouse engineers have proved that a little ingenuity and a few pieces of steel can overcome one of the most disagreeable features of the average cleaning room—the escape of dust from the tumblers into the room's atmosphere. This photograph illustrates the application of this ingenuity and steel to a tandem tumbler installation at the company's East Springfield foundry.

ONE of the outstanding features of the new East Springfield, Mass., foundry of the Westinghouse Electric & Mfg. Co. is the emphasis that has been placed on the suppression of dust at its source, in contrast to the usual emphasis upon collection after the dust has been created.

Typical of this engineering philosophy are the unusual defences erected around the tumbling barrels used at the plant. As Fig. 1 shows, each pair of rumblers is completely encased in a dust tight metal casing. In addition to this casing, the barrels are set over a pit in which several inches of water are kept. These safeguards are in addition to the usual exhausting system.

The casing is constructed of 16 gage metal and has a removable cover and front plate. An eye-bolt is fixed to the cover, as shown in Fig. 2, and the crane used for lifting the doors of the barrels is also used for lifting the cover of the casing.

With this arrangement, any dust that might escape from the barrels through the joints in the doors cannot enter the room atmosphere, but falls into the water pit beneath the rumblers. The sludge accumulation is removed at regular intervals.

As a result of these dust suppression measures, the atmosphere of the cleaning room is dustless under all conditions. The casing also serves to minimize the noise generated by the tumblers and accentuates the safety of their operation.

Another interesting feature of this foundry, which produces the cast iron components of Westinghouse refrigerators, air conditioners and fans, is the cupola charging set-up. Raw material is stocked along both sides of a recessed track and an electrically driven scale car, large enough to hold a charging bucket, runs along these tracks. Starting at the far end of the track, the scale car progresses toward a monorail charging crane track, picking up the various components of the 1600-charge as it moves along. A Sheppard monorail charging crane then takes the bucket off the scale car and delivers the charge to the cupola. Inside the building the monorail track divides into two feeders to permit charging either of the two cupolas installed in the plant.

The building that houses the new foundry is of brick and steel construction, with glass covering 60 per cent of the wall area. Fan driven ventilators change the air every 6 min., while the plant's dust collecting system is capable of exhausting 63,000 cu.in. of dust-laden air per min.

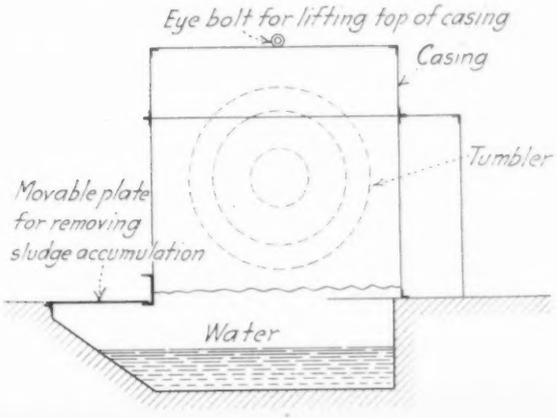


FIG. 2 — The location of the water pit and general proportions of the casing used in suppressing tumbler dust are shown in this drawing.

Metallurgical Aspects of SUPERFINISH

RECENT technical interest in the subject of Superfinish has been directed at its metallurgical aspects. This is a natural development of the interest which only last summer and fall attached itself to initial revelations and description of mechanical features of Superfinish (THE IRON AGE, Sept. 1, 8 and 22, 1938). The interest in the metallurgy of Superfinish has arisen largely out of the amorphous-crystalline distinction which D. A. Wallace, president, Chrysler Sales Division, Chrysler Corp., has attached to various types of mechanical finish, and particularly to the Superfinish process which he has fostered.

For the first time in any publication THE IRON AGE is able to present a new series of photomicrographs offering evidence as to the nature of Superfinished surfaces. These high-magnification pictures were prepared to support the claim that Superfinish removes all of the "peaks" of scratches and leaves at most only minor "valleys" below the surface. In addition, the photographic proof is claimed to show that individual crystals in the metallic structure actually are sheared through in a straight line to produce surface finish and, finally, the effects of the time element in Superfinish are clearly shown in a series of photomicrographs.

At 750 magnifications, Figs. 1 and 2 give a comparison of a ground surface and a Superfinished surface, respectively. These photomicrographs were made from a sample piece of flat steel (SAE 1015), carburized but not hardened. The specimens were prepared by an improved technique developed by the Chrysler metallurgical laboratory. These illustrations show clearly the familiar pearlite and amorphous cementite in the metallic structure. They are invaluable in that here there is considered definite evidence that fragmentation does not follow the grain boundary but goes directly across the grain—in other words, Superfinish actually has cut squarely through the crystals. No evidence of this type has been published heretofore, according to Chrysler.

To complete a detailed photomicrographic study of the effects of Superfinish on a round part like a shaft, the Chrysler production research department and metallurgical laboratory collaborated to produce the part shown in Fig. 3 and the series of photomicrographs shown in Figs. 4 to 8, inclusive.

The sample shaft, with five separate finished surfaces, was given a ground finish which had a surface smoothness of 30 to 35 micro-inches R. M. S. as read on the Abbott Profilometer. The first section was left in that condition but successive degrees of Superfinish were applied to the other sections as noted. After 5 sec. of Superfinish the micro-inch reading had been reduced to 15 to 20; at 10 sec. the reading was 8 to 10 micro-inches; at 20 sec. it was 5 to 6; the final stage gives a reading of 0.9 to 1.2 micro-inches. This completely Superfinished surface and the profile shown are regarded as ideal for a fine bearing.

The shaft for this latter test was made of SAE 1095 steel and the photomicrographs are at 750 diameters. Profiles were obtained by plating the part and cutting a blank out of it longitudinally along the centerline of the shaft.

FIG. 1—Rough ground surface of carburized SAE 1015 steel, shown at 750 diameters. The pearlitic grain and amorphous cementite are clearly visible.

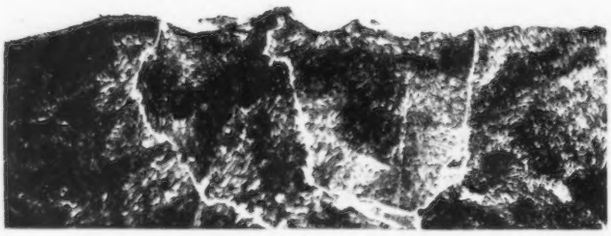
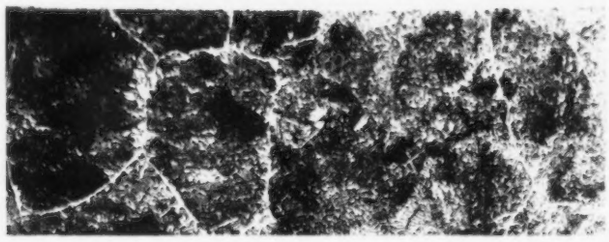


FIG. 2—Completely Superfinished surface of carburized SAE 1015 steel, shown at 750 diameters. These samples were photographed with an improved technique.



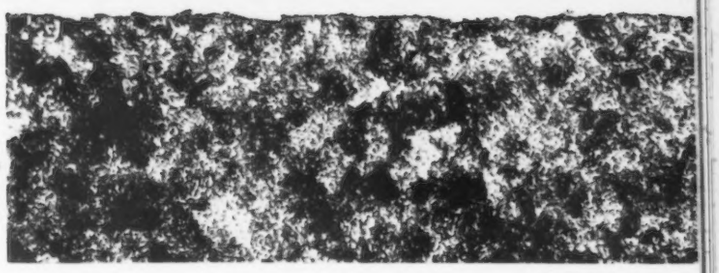


FIG. 4 – GROUND PROFILE, AT 750 DIAMETERS; 30 TO 35 MICRO-IN.

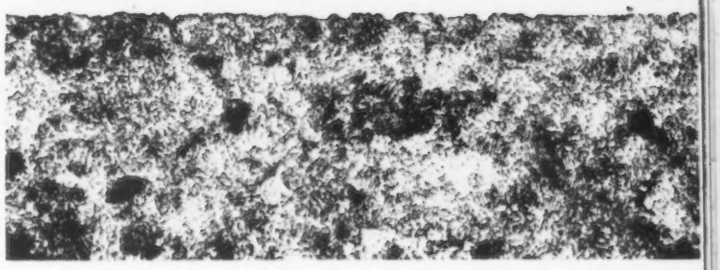


FIG. 5 – SUPERFINISHED AFTER GRINDING FOR 5 SEC.; 15 TO 20 MICRO-IN.

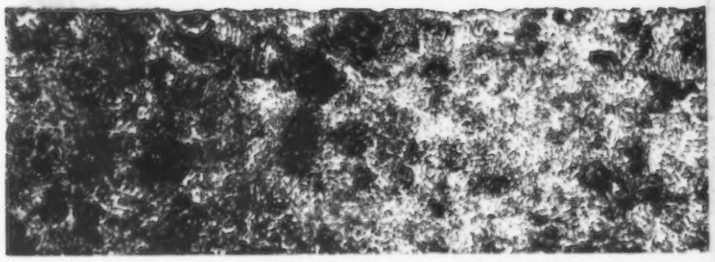


FIG. 6 – SUPERFINISHED AFTER GRINDING FOR 10 SEC.; 8 TO 10 MICRO-IN.

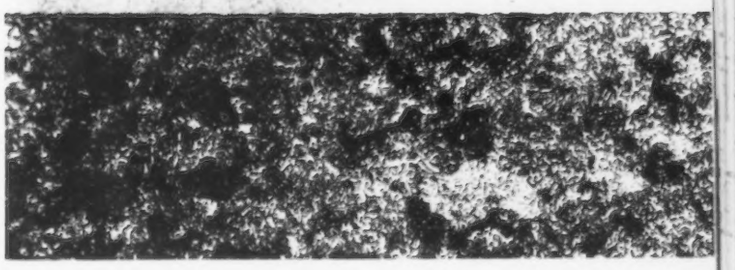


FIG. 7 – SUPERFINISHED AFTER GRINDING FOR 20 SEC.; 5 TO 6 MICRO-IN.

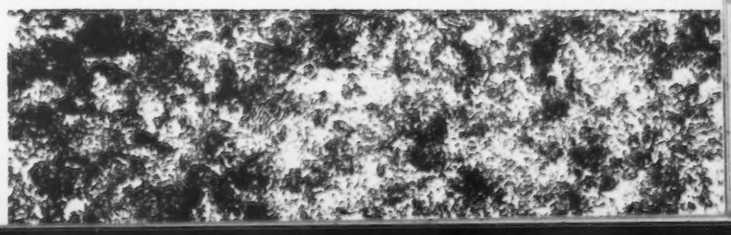


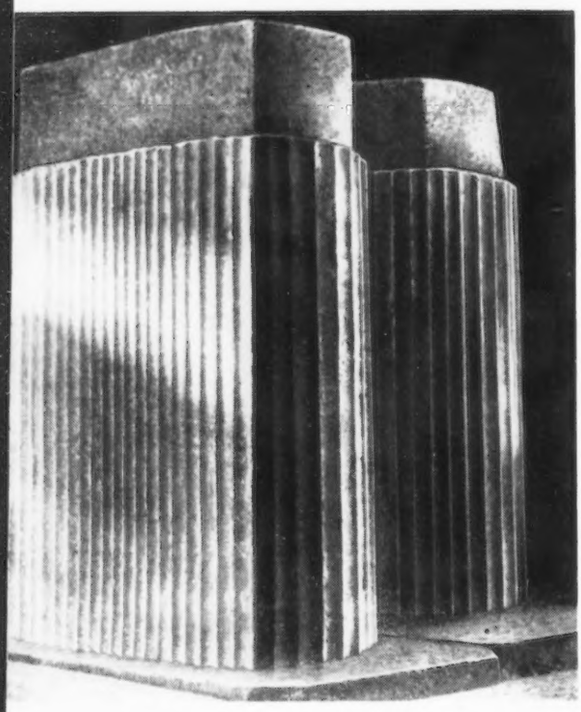
FIG. 8 – COMPLETELY SUPERFINISHED PROFILE; 0.9 TO 1.2 MICRO-IN.

FIG. 3—Sample shaft of SAE 1095 steel with five separate finished surfaces corresponding to the profiles shown in the photomicrographs. This shaft illustrates the effects of successive time elements in the Superfinishing technique. (The Iron Age, Sept. 9, 1938, Fig. 9.)

Record Size Steel Plate Flywheels Weigh 25 Tons Each

AT LEFT

ONE of the two flywheels produced by the Lukens Steel Co., and one of its divisions, the By-Products Steel Corp., for the new Mesta hot strip mill. Before machining the plates measured 165¼ in. in outside diameter and weighed 56,315 lb.

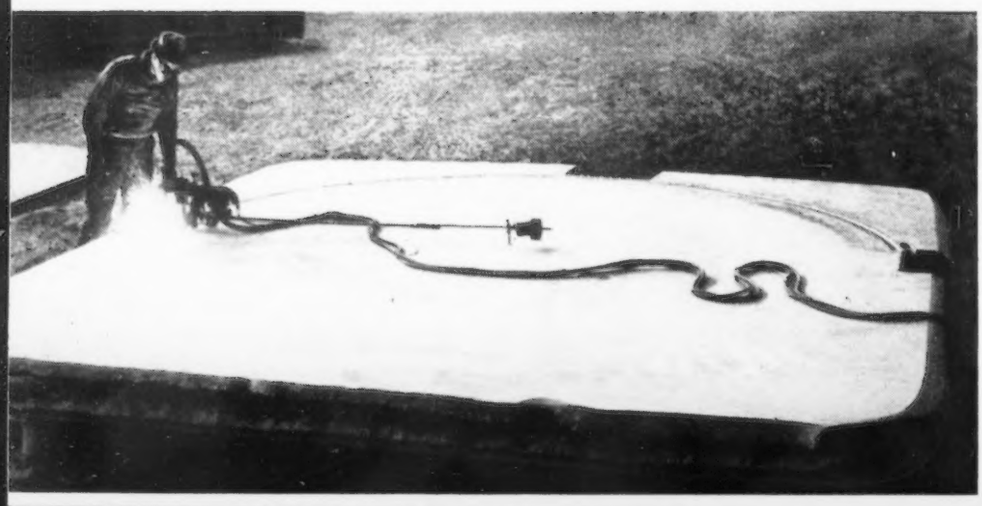


AT LEFT

THESE ingots, the largest and heaviest ever cast at the Lukens Steel Co., weigh 110,000 lb. each, including their 17,000-lb. hot top. They were made for the manufacture of steel plate for the large flywheels of a new hot, wide strip mill built by the Mesta Machine Co.

BELOW

FLAME cutting one of the plates for the flywheels of a new Mesta hot strip mill. Rectangular plates measuring 200-in. long, 170-in. wide and 9⅛ in. thick, and weighing 87,090 lb., the heaviest ever produced by Lukens, are here shown being cut into a circular plate 165¼ in. in diameter.



IN recent years, machine designers in increasing numbers have specified use of rolled steel plates for flywheels. Steel plate flywheels can be operated safely at very high peripheral speeds; for example, one now in service is reported to be used at speeds up to 14,000 ft. per min. In addition, the use of steel plate permits the designer to effect appreciable savings in flywheel weight, and eliminates pattern expense.

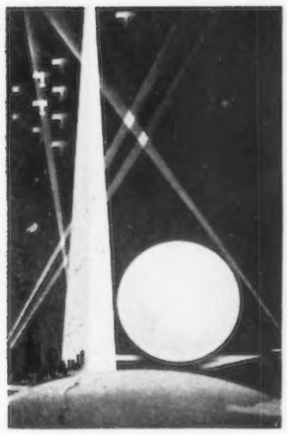
For the Mesta Machine Co., Pittsburgh, the Lukens Steel Co., and its division, the By-Products Steel Corp., Coatesville, Pa., produced two steel plate flywheels, the largest and heaviest in gage and weight ever made in steel plate.

Each of the flame-cut steel plates weighed 56,315 lb. before machining, and measured 165¼ in. in diameter and 9⅛ in. in thickness. They were used by the Mesta company in the fabrication of flywheels for the drives of a new hot wide strip mill in the Pittsburgh district.

Production of these flame-cut steel plates required pouring of the two largest and heaviest ingots ever cast at Lukens, one ingot being made for each flywheel. These ingots were 135 in. high, including the 27-in. high hot tops, 90 in. wide, and 40 in. thick. Each weighed 110,000 lb., including the 17,000-lb. hot top. They were rolled on the Lukens 206-in. mill (which can produce plates up to 26 in. in thickness) into a plate 200 in. long, 170 in. wide and 9⅛ in. thick, weighing 87,090 lb.

Each of these rolled plates was flame cut into a circular plate measuring 165¼ in. in outside diameter, 9⅛ in. in thickness, with a shaft hole 29 in. in diameter in the center. These flame-cut plates weighed 56,315 lb., the heaviest steel plates ever produced.

After flame cutting the circular plates were transferred to the Lukens machine shops, and there smooth-machined on the inside diameter to a tolerance of plus zero, minus 0.005 in. and to shaft hole size of 31.015 in. Other surfaces were rough machined to finish flywheel size of 164¼ in. in outside diameter and 8 3/16 in. in thickness, weighing 49,850 lb.



Industry at the World's Fair

THE New York World's Fair is to a large extent the story of industry. Everywhere one goes in the main exhibit area, whether in the buildings erected by foreign nations or in those of industrial companies of the United States, the industrial progress of today and glimpses of what we may look for tomorrow are graphically but simply presented for the initiated and uninitiated alike.

Not many of the buildings that have been erected are of steel because of their temporary character, but steel is to be found everywhere together with the machines that fabricate steel into the countless products that go to make up our modern civilization.

Whether a visitor's interest is in seeing the manufacture of frankfurters, glass, rubber tires or an automobile or in viewing the processes by which iron ore eventually becomes one of today's most useful articles, it is all there.

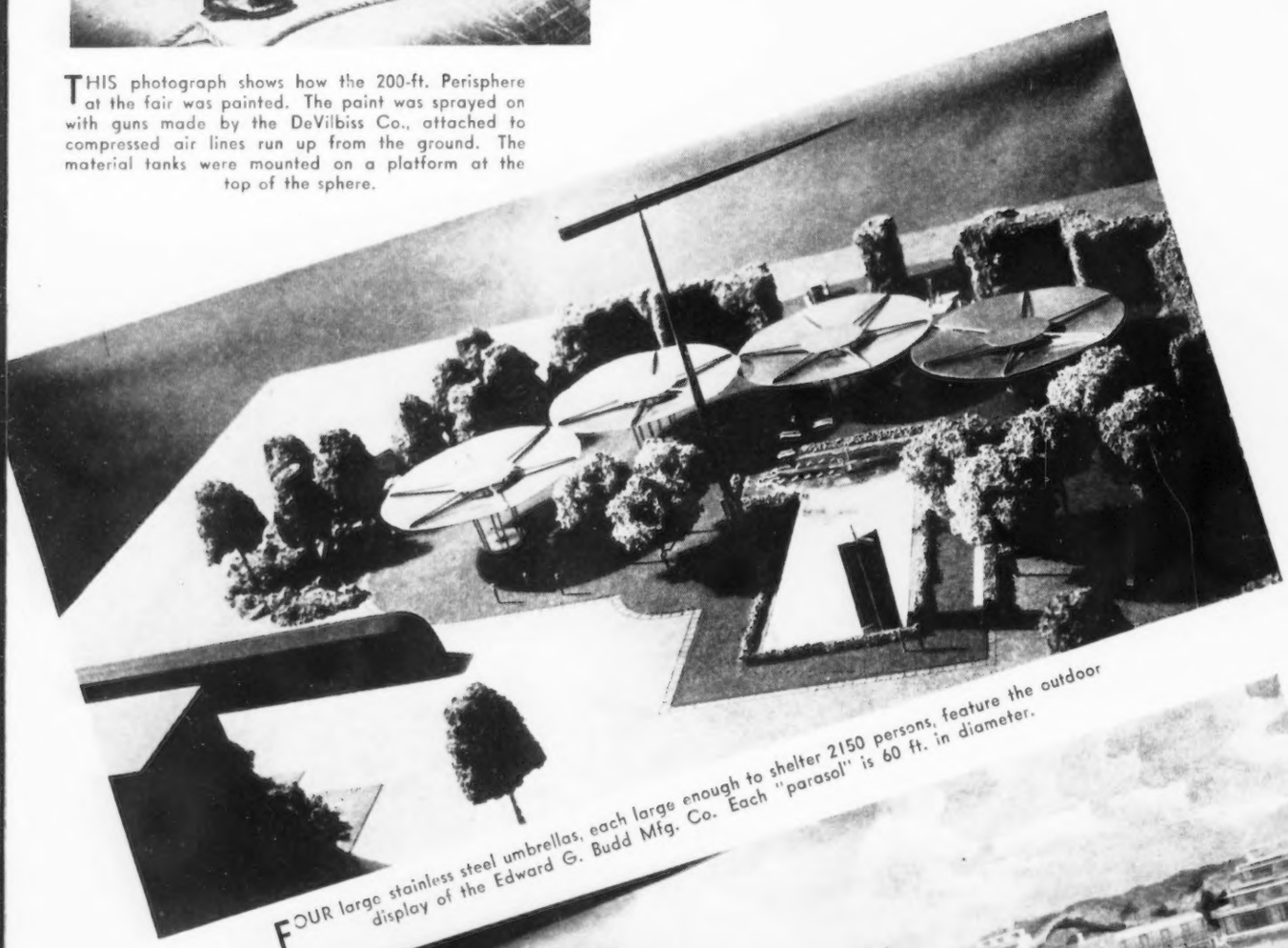
Most of steel's big customers are well represented—the railroads by one of the largest and most lavish presentations at the fair; the automobile industry by General Motors, Ford, Chrysler and the new baby car, the Crosley; the electrical equipment companies by General Electric and Westinghouse; air conditioning by Carrier; heating and plumbing fixtures by American Radiator and Crane; the public utilities by the Consolidated Edison Co. of New York; the rubber companies by Firestone, Goodrich and United States Rubber; building materials by Johns-Manville; the petroleum industry with its own special exhibit in a building of its own; the budding industry, television, is demonstrated in the exhibit of the Radio Corp. of America; plastics, by the Bakelite Corp.; the porcelain enameling industry by the Ferro Enamel Corp.; machinery of various types by Link-Belt, Otis Elevator, and others; office equipment by International Business Machines, Remington Rand, Underwood-Elliott-Fisher, Addressograph-Multigraph, Monroe Calculating Machine Co., Marchant Calculating Machine Co.; house equipment by Hoover, and so on.

Of the steel companies which are exhibiting, only the United States Steel Corp. has its own building, which is illustrated and briefly described on another page. The Bethlehem Steel Co. occupies a large space in the Metals Building, where other companies in steel manufacture or closely allied thereto will be found, including the American Chain & Cable Co., John A. Roebling's Sons Co. and Timken Roller Bearing Co. The copper and brass industry also has an extensive cooperative exhibit in the same building. The Jones & Laughlin Steel Corp. has no exhibit of its own, but it is represented through the use of its Junior beam, which is used in the floor construction of three of the demonstration homes in the "Town of Tomorrow." The Republic Steel Corp. is prominently represented in the building of the Borden Co., having furnished all of the stainless steel for the dairy equipment shown in operation.

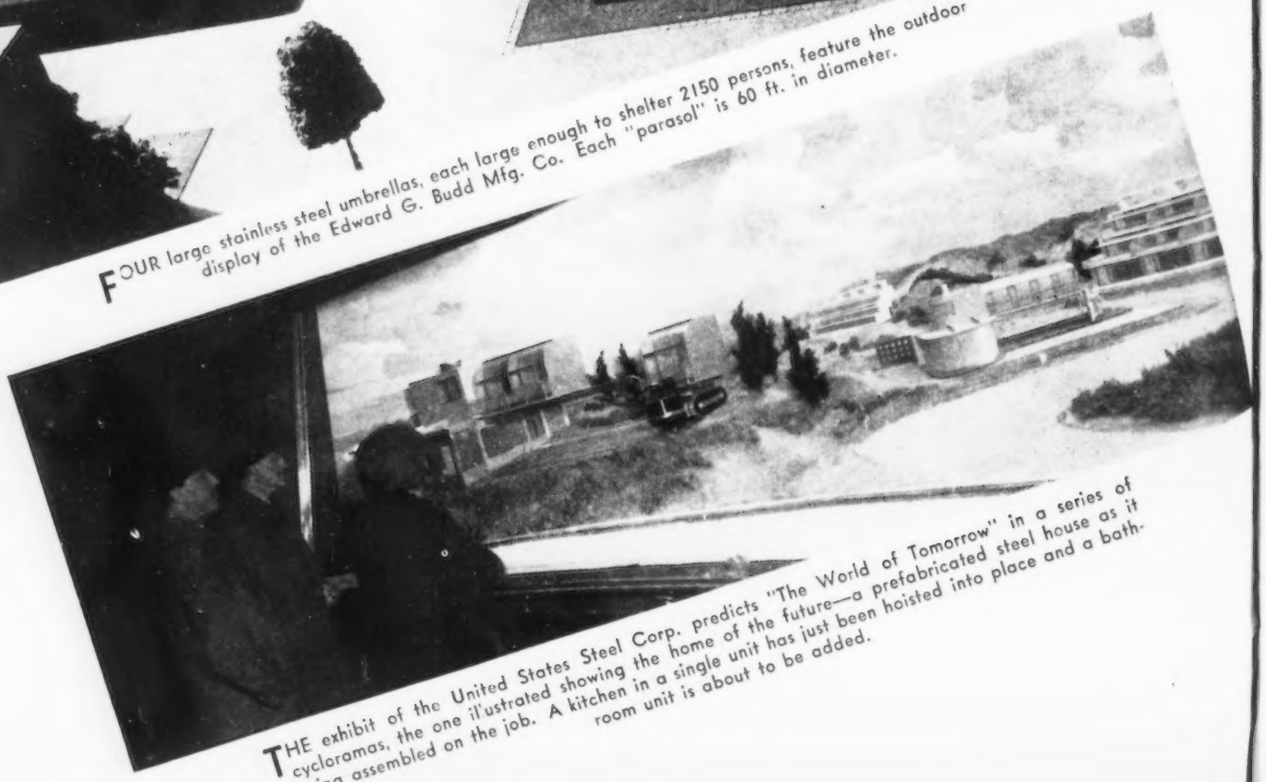
Other exhibitors include E. I. du Pont de Nemours & Co., National Cash Register Co., American Hardware Corp., Bemis & Call Co., Cherry-Burrell Corp., Chicago Flexible Shaft Co., Sperry Gyroscope Co., Yale & Towne Mfg. Co. and Yale Safe & Lock Co.

Industry at the World's Fair

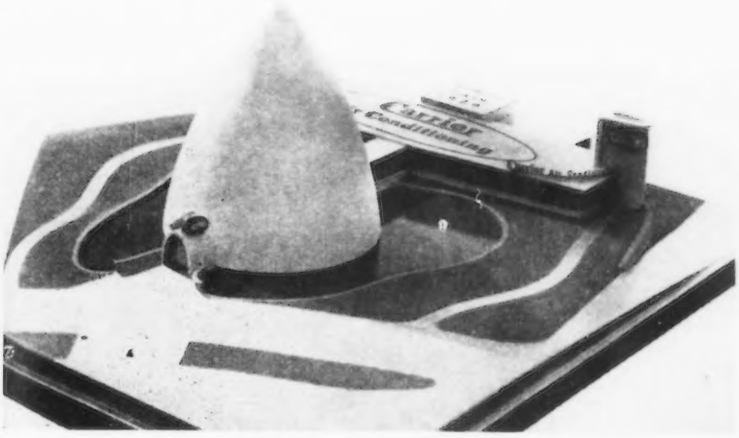
THIS photograph shows how the 200-ft. Perisphere at the fair was painted. The paint was sprayed on with guns made by the DeVilbiss Co., attached to compressed air lines run up from the ground. The material tanks were mounted on a platform at the top of the sphere.



FOUR large stainless steel umbrellas, each large enough to shelter 2150 persons, feature the outdoor display of the Edward G. Budd Mfg. Co. Each "parasol" is 60 ft. in diameter.



THE exhibit of the United States Steel Corp. predicts "The World of Tomorrow" in a series of cycloramas, the one illustrated showing the home of the future—a prefabricated steel house as it is being assembled on the job. A kitchen in a single unit has just been hoisted into place and a bath-room unit is about to be added.



ABOVE

UNITED STATES STEEL CORP. is the only steel company to erect its own building at the fair. It is a stainless steel hemisphere 132 ft. in diameter and 66 ft. high. In the garden behind the building is a steel trellis 200 ft. long and 30 ft. high at the base of which is an exhibit of the steel products furnished by U. S. Steel to the major consuming industries.

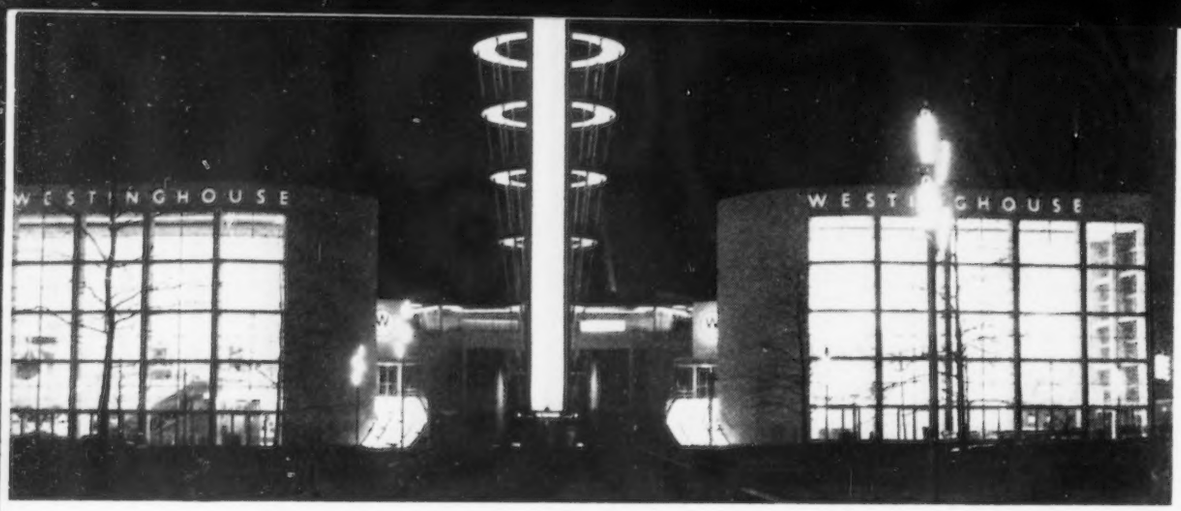
o o o

AT LEFT

CARRIER CORP.'S exhibit is devoted entirely to air conditioning science. It is air conditioned with one of the largest type systems ever used for public exhibitions, the inner workings of which are inclosed in a glass case for public examination. The Eskimo Igloo is 70 ft. high and is made of white stucco with a special crystal finish to simulate snow. It is connected by a glass-walled arcade to a second exhibit area designated as the "Hall of Weather Makers."

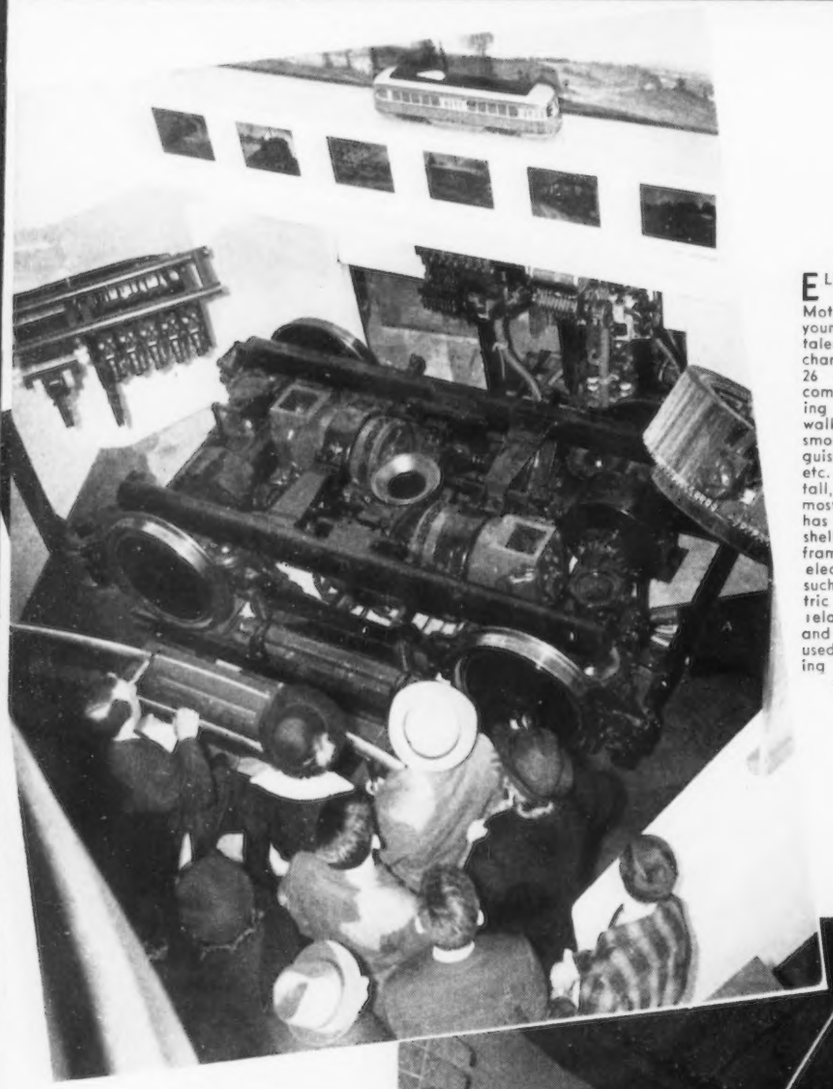
RIGHT

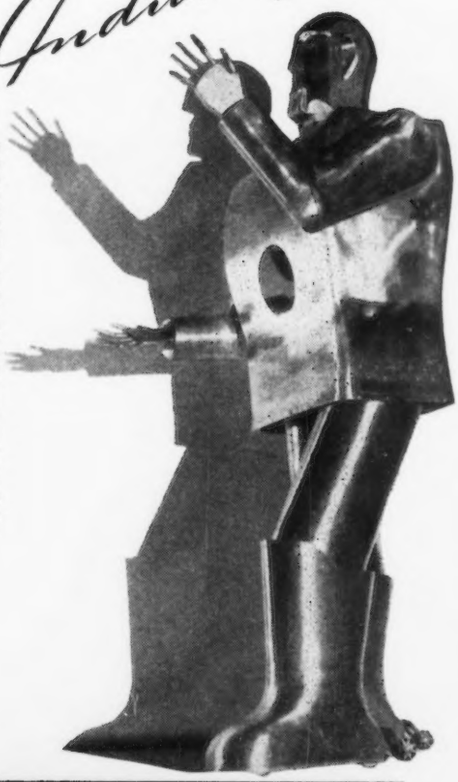
A GRAPHIC presentation of how steel is made is the central theme of Bethlehem Steel Co.'s exhibit. Separate panels that cluster in circular formation beneath a 50-ton ladle of welded type construction show the materials that go into making a ton of coke, a ton of pig iron and a ton of steel with the resulting by-products. Animated models also show steel making operations from blast furnace to rolling and finishing. A mural depicts by means of special lighting effects the uses of steel in the City of Tomorrow.



NIGHT picture of Westinghouse building. The theme center, the 120-ft. high "Singing Tower of Light," is formed of a lighted pylon and a series of six concentric steel rings. It is the scene of a display of smoke, water, colored lights and fireworks, synchronized to music.

Industry at



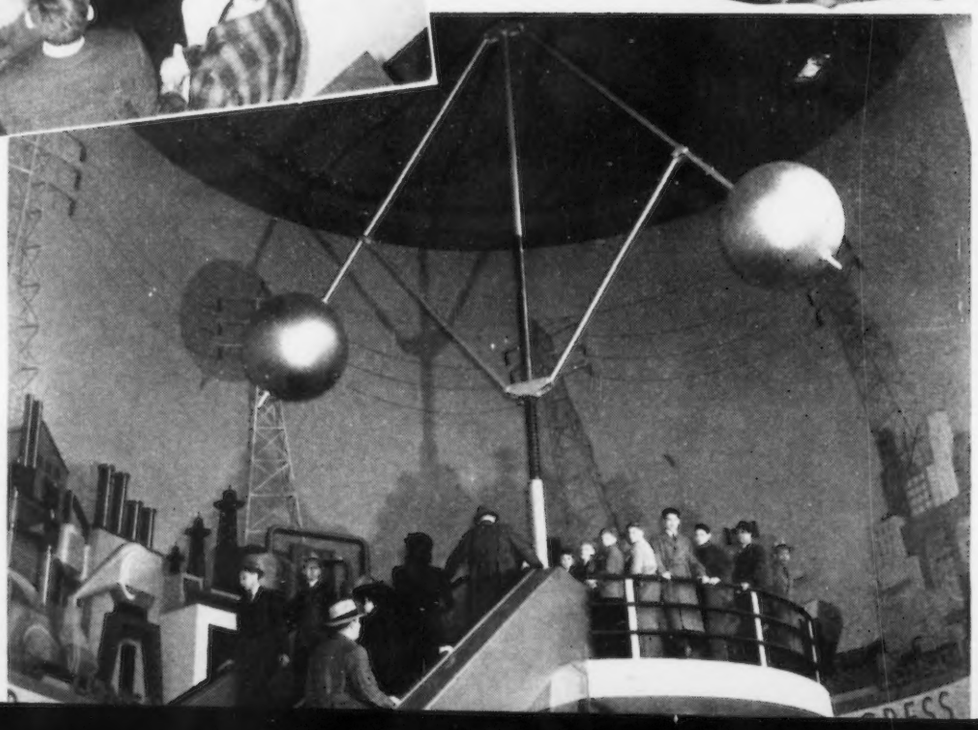


AT RIGHT

ELEKTRO, the Westinghouse Moto-Man and the youngest and most talented of mechanical men, has 26 tricks at his command, including such acts as walking, talking, smoking, distinguishing colors, etc. He is 7 ft. tall, weighs almost 300 lb., and has an aluminum shell over a steel frame. Well known electrical devices such as photoelectric cells, electric relays, sound tracks and the like were used in constructing this electrical entertainer.

ABOVE

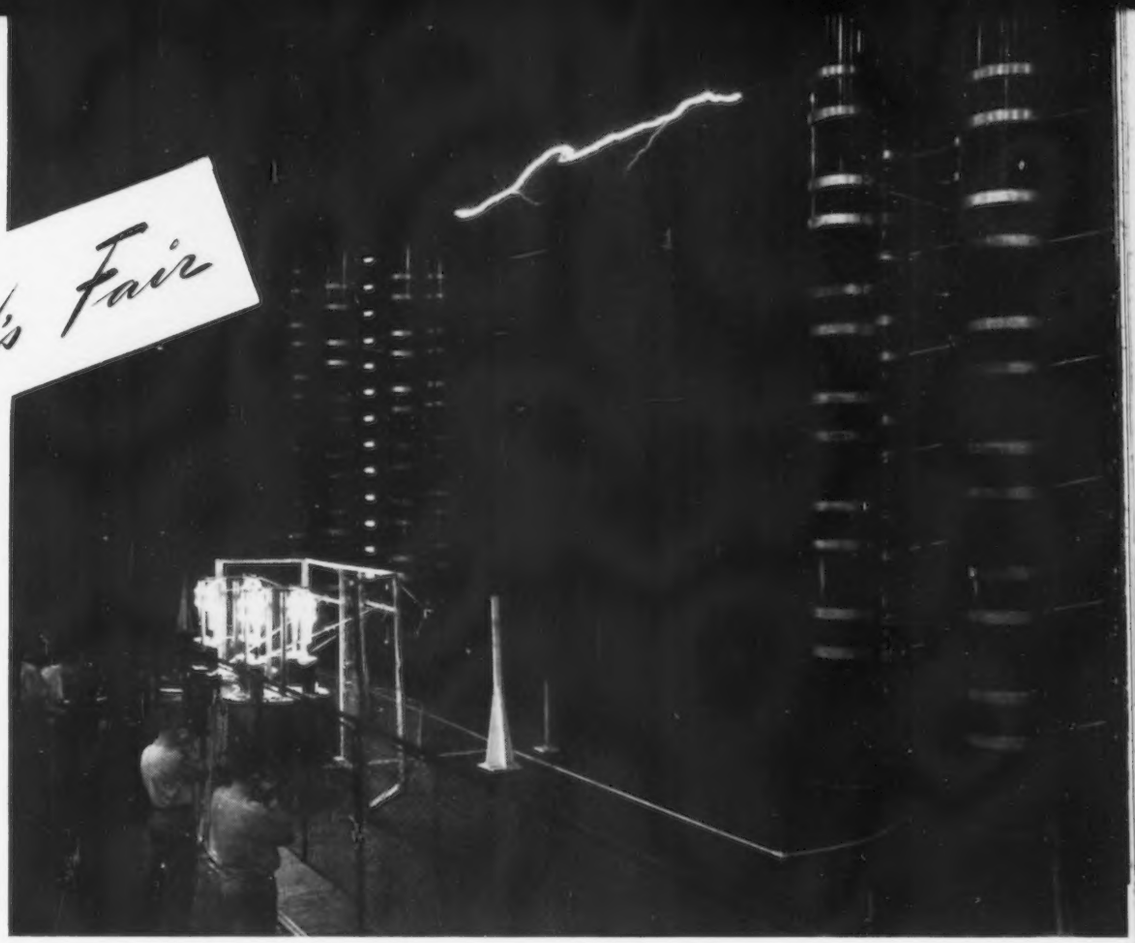
WESTINGHOUSE displays depicting "electricity's support of modern industry" include this full size street car exhibit. Visitors can sit in the motorman's seat and cause the truck to move forward or backward, brake, etc., the miniature street car at the top operating in synchronism with the full size apparatus.



AT RIGHT

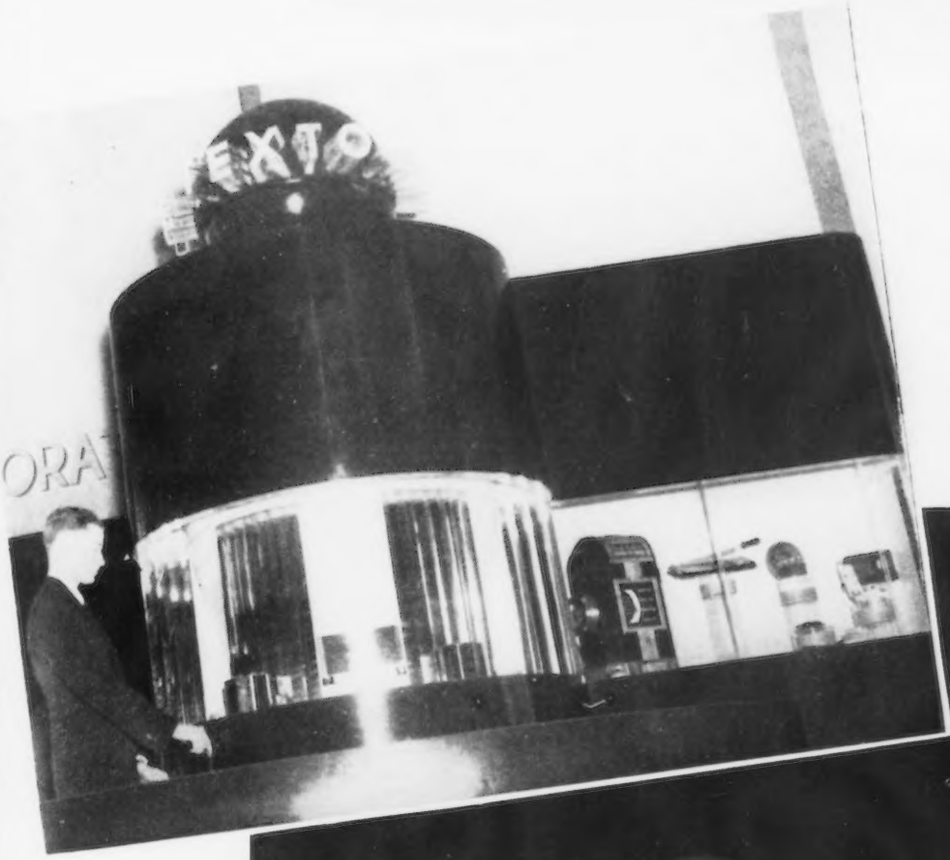
ABOVE this high platform in the Westinghouse Hall of Power whirl these 6-ft. diameter twin aluminum balls. The device is a governor such as used in motors, and is one of the largest ever built, its construction in a public building being regarded as a feat of engineering.

the World's Fair



AT RIGHT

THE most spectacular feature of the G-E exhibit is the demonstration of man-made lightning, 10,000,000 volts, which crashes through space in an arc 30 ft. in length. In another demonstration in same high ceilinged area, Steinmetz Hall, a million-volt, 3-phase arc is maintained between three terminals. The arc appears in three colors, and wire conductors leading to the terminals bristle with a corona discharge — a most striking effect.



AT LEFT

THE G-E general exhibit area features a number of displays of interest to engineers as well as to the general public. In addition to X-ray, television, etc., there is a working demonstration of three large plastic molding presses, each with a two-cavity mold. Interesting applications of Textolite are exhibited on both sides of the presses.

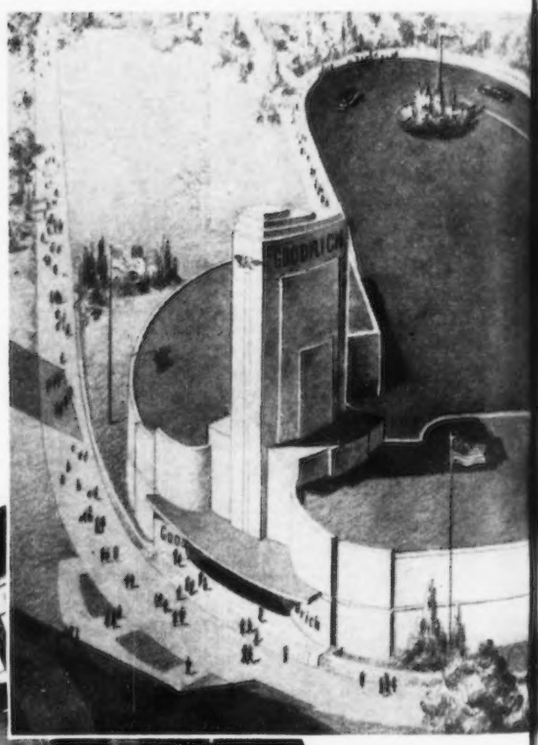
BELOW

NIGHT lighting effects of the General Electric building transform the walls of Steinmetz Hall into planes of diffused, copper-colored light to form a background for the central spectacle of a flash of lightning splashing into a pool. The zig-zag bolt of lightning, the theme symbol of the G-E exhibit, is made of stainless steel and is 129 ft. high. Its construction presented some unusual problems.

THESE young ladies are graphically portraying the central theme of the Timken Roller Bearing Co.'s exhibit—the enormous strides made by industry in the past 40 years. Both the "horseless carriage"—vintage 1889—and the streamlined locomotive in the photograph are equipped with Timken roller bearings. The "horseless carriage," owned by J. R. Drummond of the Timken company, still runs on its original bearings.

A MINIATURE tire factory, producing tires at the rate of on exhibit of the Firestone Tire & Rubber Co. Visitors are al of the crude rubber to the final

Industry at

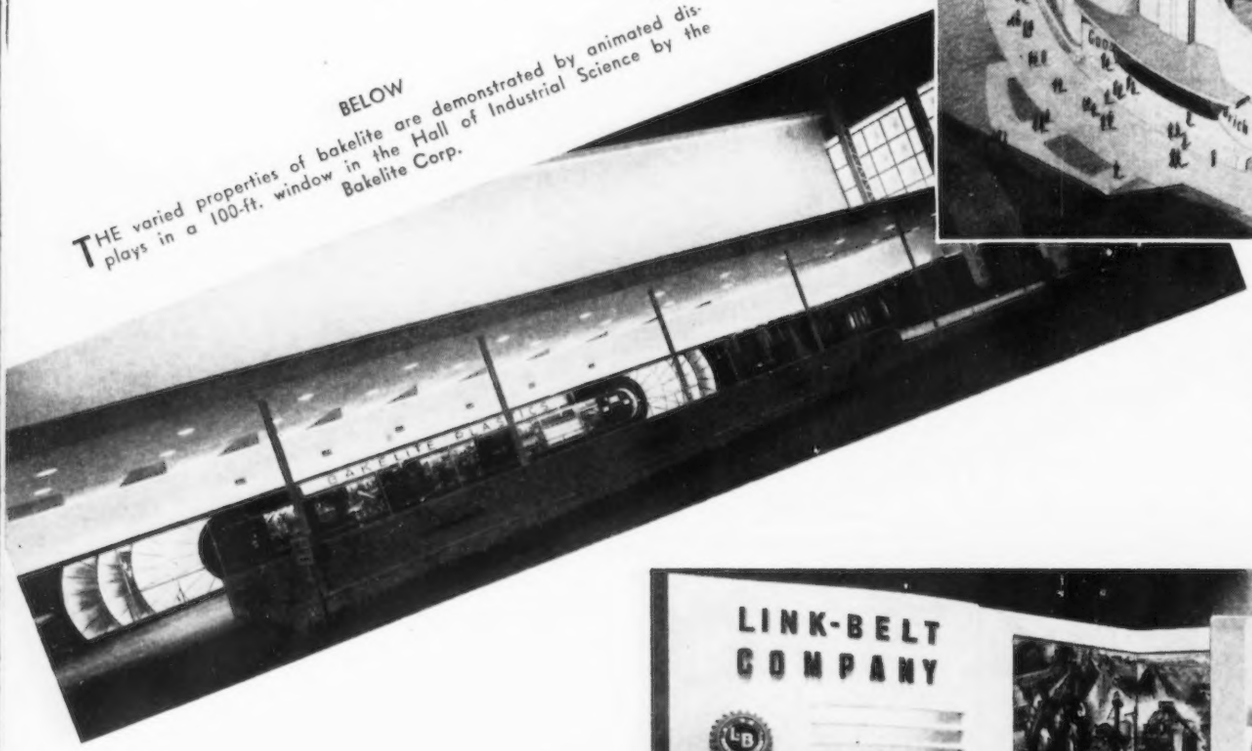


ABOVE

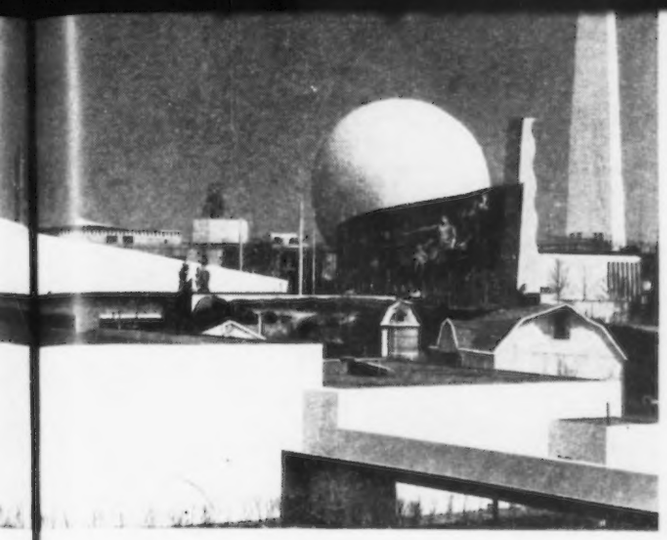
IN the B. F. Goodrich Co.'s building is a display showing publicly for the first time the Anode process of making rubber glov lasti mob latte sists bono

BELOW

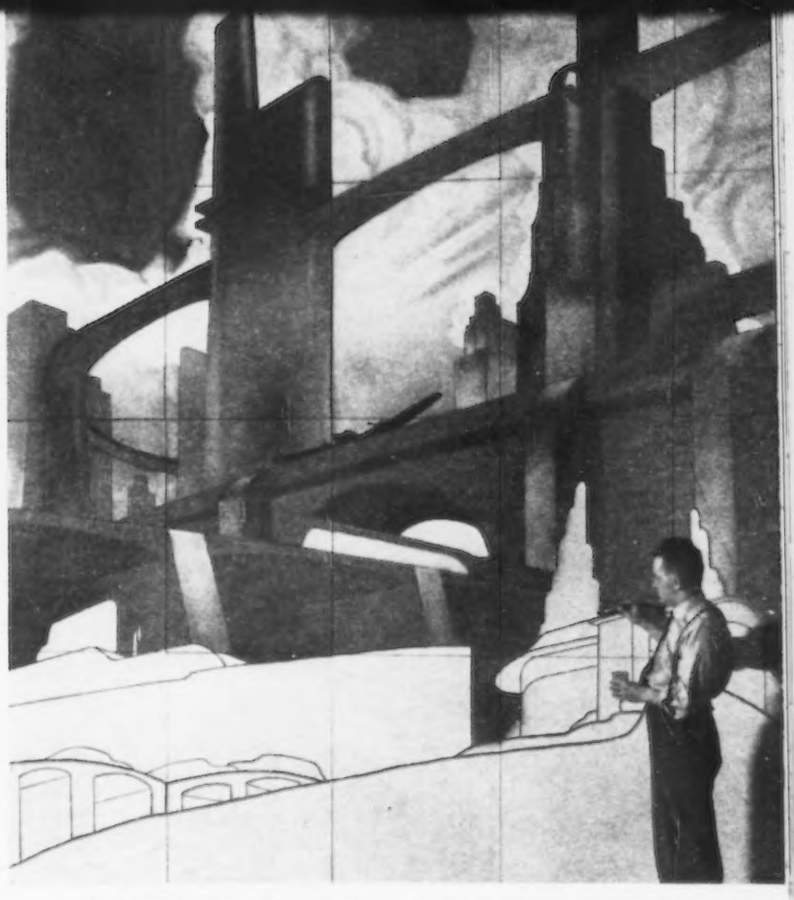
THE varied properties of bakelite are demonstrated by animated displays in a 100-ft. window in the Hall of Industrial Science by the Bakelite Corp.



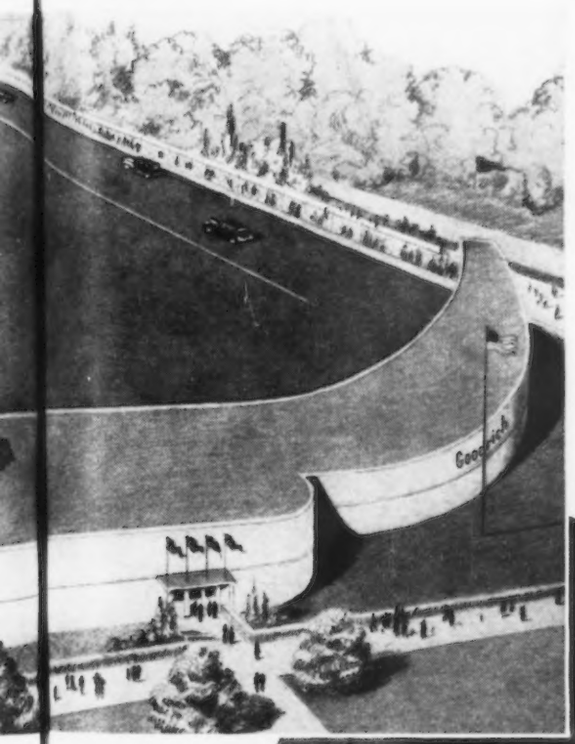
THE story of industry's effort to ease labor's burden and expedite production is told in the Link-Belt Co.'s exhibit by working models, murals and dioramas of mechanical handling and conveying equipment.



of one every four minutes, is the chief feature of the are able to observe the complete process from the mixing final wrapping of the tire.



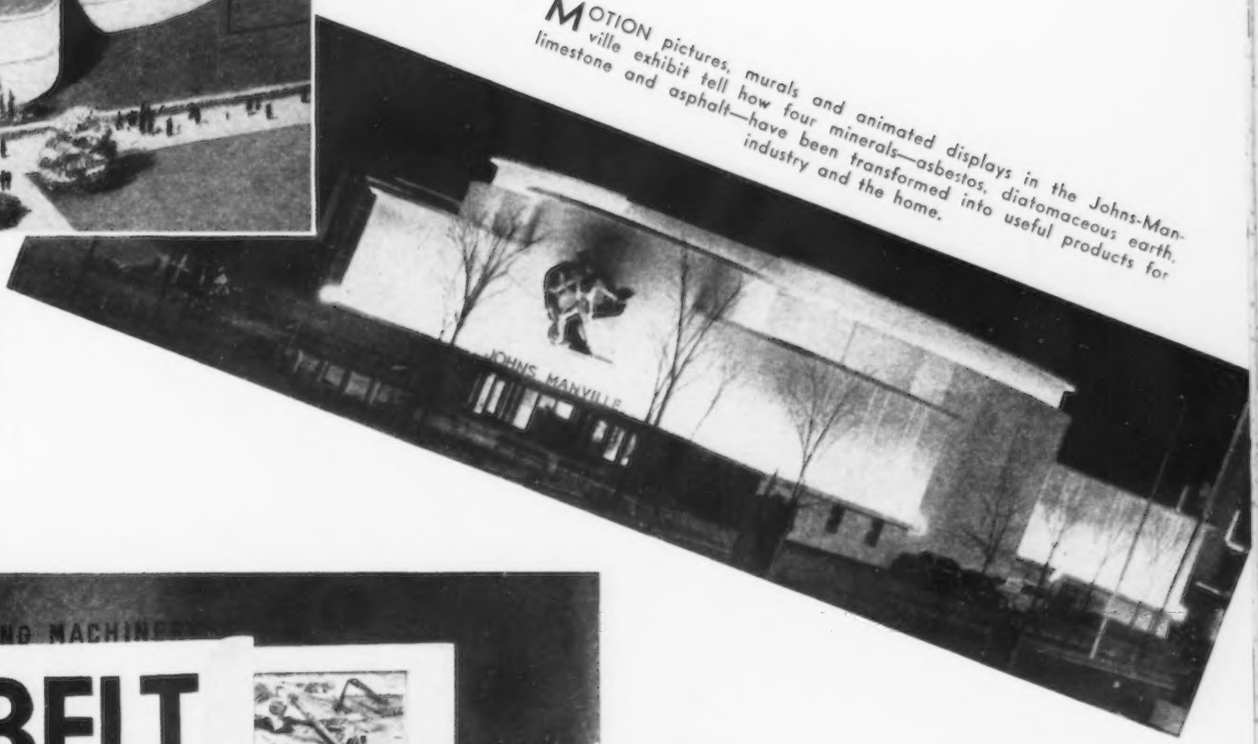
A LARGE porcelain enamel mural of the "City of Tomorrow" is the outstanding attraction of the exhibit of the Ferro Enamel Corp. In making this mural, which measures 12½ ft. x 17½ ft., colors were applied by brush and air-gun and all were fired at once. Past practice was to apply colors by stencils or screens and to fire each color separately.



gloves and a torsilastic rubber automobile spring. This latter device consists of rubber bonded to a metal shell.

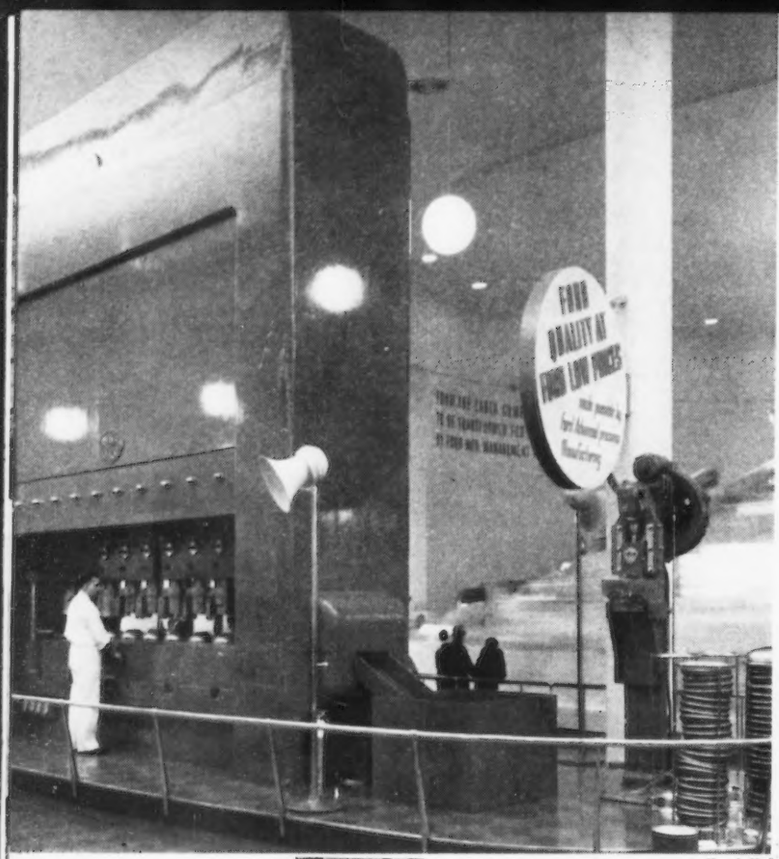
the World's Fair

MOTION pictures, murals and animated displays in the Johns-Manville exhibit tell how four minerals—asbestos, diatomaceous earth, limestone and asphalt—have been transformed into useful products for industry and the home.



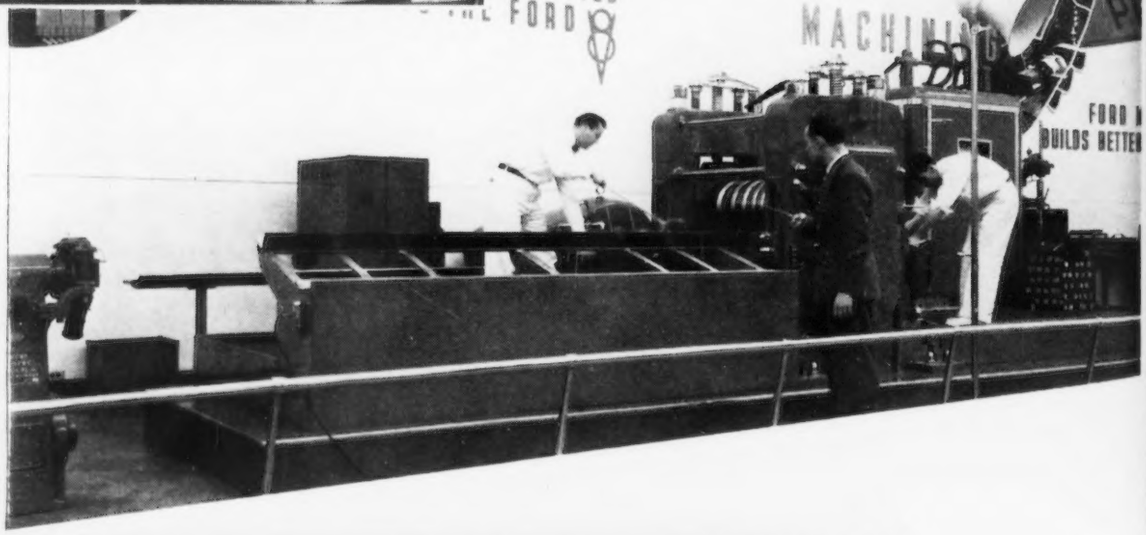
A LARGE sculptured figure, depicting the spirit of power, dominates the Link-Belt display, while various types of driving chains, speed reducers and conveying equipment, all in operation, are shown in booths running the length of the exhibit

Industry at the World's



BELOW

A FEATURE of the Ford exhibit is the carrying out of complete manufacturing processes from the raw material. In the set-up pictured, square billets of alloy steel are brought to forging heat in the electric furnace and are reduced in section in the double pass rolling mill shown as the first step in the manufacture of Ford steering gear drag links. Subsequent operations, performed by Thompson Products Co., include sawing to length, reheating and upsetting one end; trimming, coining, piercing and bending—the last all carried out in one toggle press—plus a variety of machining and assembly operations.



ABOVE

W. J. CAMERON'S famous example of the making of inner shells for hub caps by machine and by hand is carried out before the visitor to the Ford exhibit. Hand tools cost only $24, but it costs $2.50 to make a hub cap by hand. In the 10-station progressive press, which weighs 160 tons and cost $125,000 with dies, the unit cost becomes 12c. Were all car parts to be made by hand, the modern Ford car would cost about $17,850.

o o o

AT LEFT

THE Ford Cycle of Production comprises a huge turntable, 100 ft. in diameter, and 30 ft. high, weighing 152 tons and floated on a circular moat so that the mass can be revolved slowly by a small electric motor. The progress of each of the raw materials entering the car is shown by animated models depicting the principal processes used.

o o o

Fair

ABOVE

PRINCIPAL feature of General Motors Highways and Horizons exhibit, the largest one at the fair, is a scenic ride into the future. In 600 comfortable moving chairs, with synchronized talk wired to each pair of seats, spectators tour a miniature landscape covering 35,738 sq. ft. on a special Westinghouse conveying system one-third of a mile long on several levels of the exhibit building. The display demonstrates how city congestion will be avoided and super speedways will cross the country.

o o o

AT LEFT

A RETREAT from hot weather will be found in Chrysler's frozen forest where real frost crystals will form on the refrigerated trunks of white plumed palm trees. The tree trunks are made of sheet metal and within the core are cooling coils supplied with refrigerant by radial Airtemp compressors, seen behind plate glass windows.

AT RIGHT

PLEXIGLAS, one of the new transparent plastics, is used in the construction of the body shell of this X-ray Pontiac at General Motors exhibit. The display is intended to show the rigid interior bracing and such features as the working mechanism of the no-draft ventilation system employed in the Unisteel Fisher body. In the background is one of the two 15 x 65-ft. murals executed by Dean Cornwell in aluminum and gold leaf against a black micarta background.

THIS WEEK ON THE ASSEMBLY LINE

By W. F. SHERMAN
Detroit Editor

. . . Auto production leveled off in past week at 72,375 units . . . Mechanical changes minor for 1940 models, but Buick tools up new transmission plant . . . Major producers concentrating on plastic development.

DETROIT—While the trend of automobile output continued at the relatively low level established two weeks ago, the number of assemblies rose slightly in the past week due principally to the return to work of one of the independent plants. Interest during the week was centered mostly on preliminary activity for 1940 model production.

Assemblies totaled 72,375 cars and trucks in the United States and Canada, compared with 71,420 the previous week and 49,415 a year ago, according to Ward's Automotive Reports. Many of the plants maintained output unchanged, including Ford-Mercury at 16,500, Lincoln-Zephyr, 400, and Chevrolet, 15,000. Plymouth decreased from 8650 to 8570. The General Motors volume was up slightly to 27,120 from 26,599 the previous week, and Chrysler produced 17,960 cars and trucks against 17,590 in the previous week.

Production Expected to Taper

Recapitulation of the plans and prospects of auto companies indicates an erratic tapering of production with the low point to be reached in six weeks. Sales continue to be spotty and numerous campaigns to move cars from retailers display rooms are being planned. According to the Automobile Manufacturers Association, the April total of 359,200 passenger cars and trucks (factory sales), while representing a gain of 51 per cent over April of last year, was 8 per cent less than March, 1939. For instance, one manufacturer which delivered 16,010 cars in April showed a gain of 9.8 per cent over cars delivered in March and 55 per cent over cars delivered in April a year ago, but in most cases manufacturers' statements of car deliveries (based on 10-day field reports) failed to include comparisons with March. However, they do indicate that the sales for this April are in the order of 20 to 25 per cent above last April, a marked drop since most of the monthly comparisons for the first quarter indicated gains of 60 to 70 per cent over a year ago.

One of the most authentic sales reports is that for the General Motors Corp. which states that April sales of General Motors cars and trucks from all sources of manufacture total 158,969 compared with 109,6.9 in April a year ago. Sales in March were 182,652.

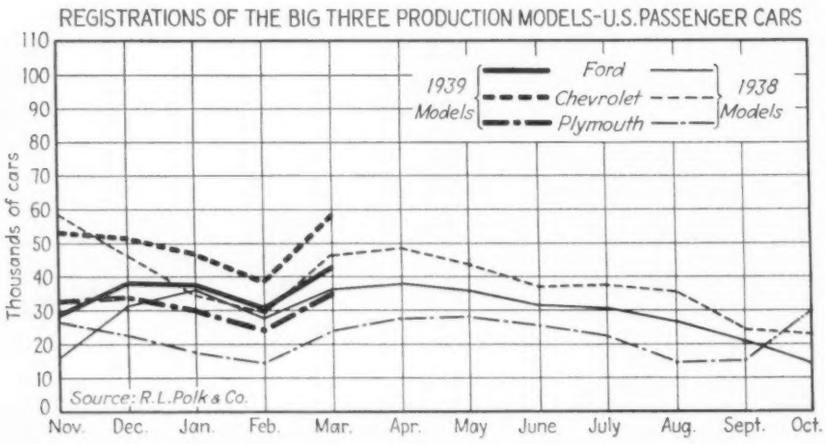
Studebaker Sales Gain

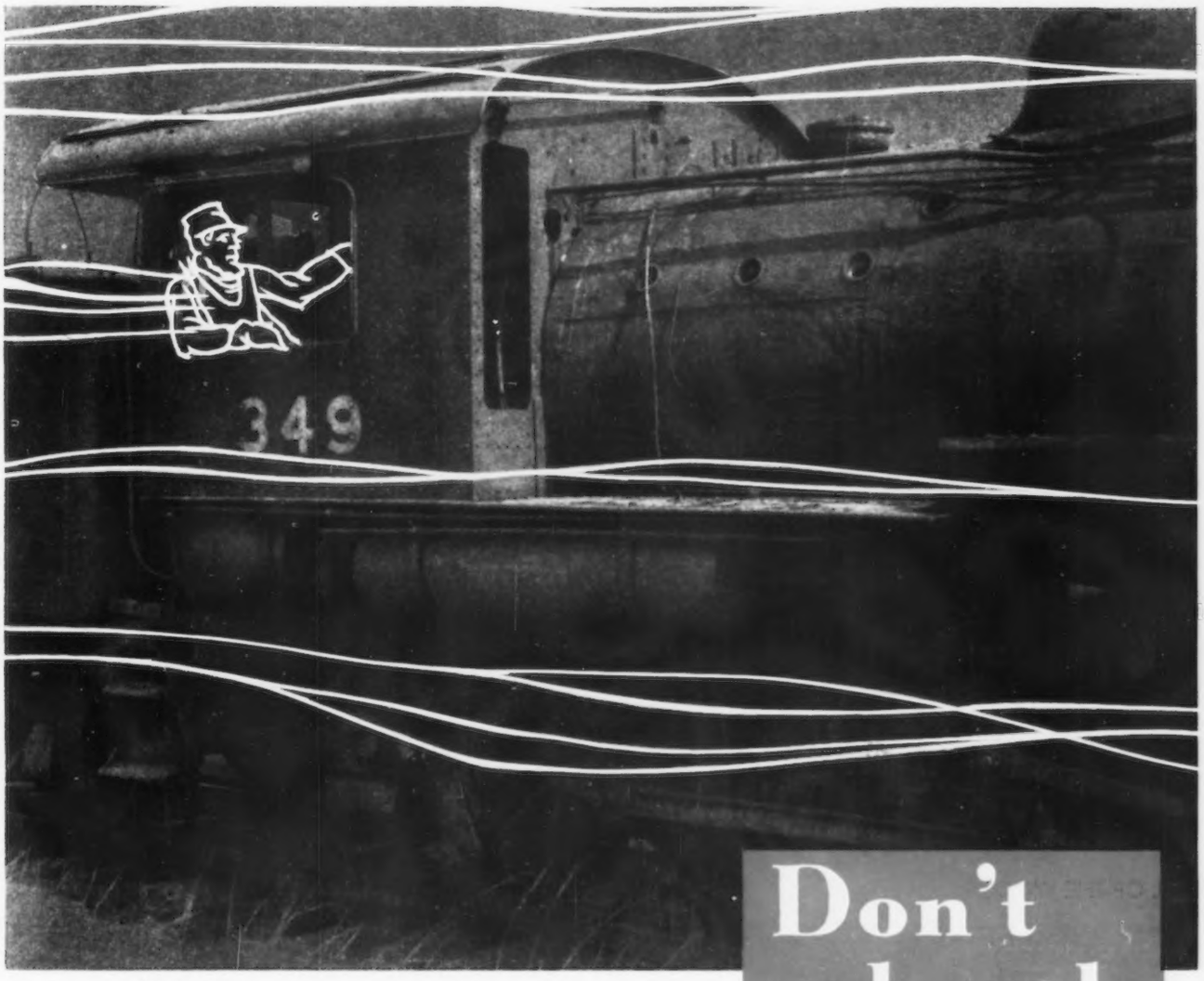
Success of the new Studebaker Champion is attested by the bulge in sales after its announcement to the public. Studebaker factory sales of 10,974 passenger cars and trucks in April exceeded factory sales for the entire second quarter of last year and were more than 2¾ times those reported for the same month in 1938. In fact, the year so far has been more than twice as good as 1938. Factory sales for the first four months of the year were 30,720 as compared with 14,126 in the same period last year.

The new low-priced car was just becoming available to the public during April but retail deliveries mounted to 7385 units as compared with 3329 a year ago. The factory is operating five and one-half days a week.

1940 Model Changes

One of the minor changes on 1940 models which has special significance will be in the attachment of springs and a change in the method of using spring shackles. Two prominent manufacturers, one of them Chevrolet, will make use of a new type of spring





Don't laugh

It could be repaired—so could a lot of old machine tools—but...

IT COSTS money to keep fixing old worn out parts. Often without realizing it the entire mechanism has been replaced piece by piece at twice the cost of a new one without any improvement in efficiency. This old "hog" hauled its share of pay loads—and paid for itself many times over. Now its owners have sold it for scrap and ordered a new one to haul the heavier work modern railroads must handle.

Here is a lesson for every shop using machine tools. Before you spend good money keeping obsolete equipment "rolling," investigate the savings that new, efficient tools will make in your production costs. Add to those savings the repair bills for your old equipment and you'll be surprised how quickly they equal the cost of new machines.

In a little while American shops will have to operate at capacity. What that capacity will be depends on the efficiency of machine tools. Obsolete but operatable machines can never compete with new, modern equipment. And it costs as much for the one as for the other.

Let Pratt & Whitney trained experts help you weed out the machines that you can replace *profitably*. These men know modern shop practice. Show them your problems and get their suggestions. There is no better paying investment than the right tools for the job!

Pratt & Whitney

Division Niles-Bement-Pond Co. • HARTFORD, CONN.

mounting which uses a "tension shackle" to put tension in the main leaf of the rear springs. This appears to be only a minor change from the "compression shackle" formerly used to put tension in the main leaf, but actually it is regarded as a step in providing satisfactory ride which will help insure the continued use of leaf springs and halt the apparent trend of a year or so ago toward coil suspension of rear wheels, because the new method of mounting permits the use of softer rear springs, giving fewer oscillations per minute. The change is expected to eliminate the forged bracket usually used on the rear ends of the frame and substitute a curved piece of bar stock which will loop down under the spring eye.

Among other changes previously reported is that pertaining to leaf spring seats. It now appears definite that Chrysler Corp. will adopt this type of seat for one of its fastest selling group of cars.

Changes in design, and an important change in location of manufacture, are predicted for the Buick-Oldsmobile automatic transmission. The decision to remove this manufacturing operation from the Buick plant at Flint and the accompanying decision to move the operation to one of the old Fisher body plants on Theodore Street in Detroit has been accompanied by the initiation of one of the largest buying programs of the year, it is understood. Minor changes being made in the Buick rear axle are worthy of mention at this time only because mechanical innovations in 1940 models will be rare.

Possible changes in source of supply for some of the independent automobile manufacturers is indicated by the fact that Briggs Mfg. Co. is actively seeking new commitments to replace the Ford business which has been shifted to Ford's own body plant at the Rouge. Briggs is now understood to be furnishing sample parts to Packard, Nash and Willys.

Fluid Drive Makes Headway

The Chrysler fluid drive which has been offered since last fall on the Chrysler Custom Imperial model now is being offered on the regular Chrysler Imperial as well. The industry looks for more or less gradual adoption of this type on other Chrysler cars in the next year. This step is regarded as the first part of a broadening out process. Without a doubt, this type of drive will be generally accepted when the next major mechanical changes are made in the industry. A full-size working model of the drive is on exhibition at the Golden Gate International Exposition and a similar model will be shown at the New York World's Fair. This fluid drive, or fluid flywheel, described in detail in the Assembly Line when it was announced last fall, eliminates the use of clutch and gear shift except in reverse. There is no mechanical connection between the source of power and the transmission.

The Trend Toward Plastics

Also worth watching carefully in the next few years will be the trend to plastics. The plastic car really is the designer's dream. As envisioned by S. G. Saunders, staff officer of Chrysler Corp., the car body of the future will be molded or pressed out in one piece of plastic. Speaking unofficially before the American Chemical Society, Saunders declared that changes must be made in plastics before they can be used this way, however. And the goal he set was a hard one—plastic materials, he said, must first be given the strength and rigidity of alloy steel, the ease of forming and shaping of potter's clay, the toughness of sugar maple and high precision surface finish.

Pointing out that the automobile industry as yet appears skeptical of the possibility that anything so far accomplished for plastics can take the place of steel in fundamental and structural parts of the car, he added that it is entirely possible that future improvements in plastics may result in their increased use by the industry.

Here it may be said as an aside that Chrysler is even now engaged in laying tentative plans for a plastic molding division. Work has progressed to the point where floor plans have been laid out and estimates of the amount of equipment required have been made. No indication has been given that such plans will be used in the near future, however. Along with this, Chrysler has shown a great deal of interest in the development of injection molding machines capable of making larger pieces than are common now.

There is no need to conclude that such activity and ideas are restricted to Chrysler. All of the other auto manufacturers are following parallel courses. In fact, automotive interest in plastics is becoming so concentrated

THE BULL OF THE WOODS — BY J. R. WILLIAMS

that production of many more plastic parts for automobiles cannot be far off. Success in this field cannot much longer evade the research men because efforts have been doubled or tripled in the last year on this subject.

Last year Edsel Ford admitted that Ford Motor Co. has had considerable success in molding such units as door panels. Then, as reported in the "Assembly Line" several weeks ago, attempts were made to mold half a Lincoln-Zephyr body from plastic for exhibit at the World's Fair. Shortly after that, Fisher Body installed at the fair a complete plastic-covered automobile. Of course, this was not intended for an example of production possibilities: it was merely a demonstration piece set up to show the inside of the modern automobile. But nevertheless it shows what can be done with certain kinds of modern plastics.

A Correction

Whiting Hall, advertising manager of the American Bantam Car Co., Butler, Pa., asks for a correction of the following statement in the Assembly Line in the May 4 issue: "Price of the Bantam is $399 without taxes. It is interesting to note that the lowest delivered price runs up to $497.50 on the Bantam when taxes, etc., are added." Mr. Hall says:

"All publicity and all Bantam advertising states specifically that the price of $399 includes not only Federal taxes but such accessories which are usually extra—radiator ornament, bumper guards, etc. The price of $497.50 which you mention is for our next to highest priced model, the four-passenger sport speedster."

11th Annual Steel Bridge Award Is Announced

THE Eleventh Annual Bridge Award has been announced by the American Institute of Steel Construction. Entries will close June 1 and the most beautiful bridges will be selected from photographs of steel bridges completed during 1938. The following data should accompany the photographs submitted as requested: Name of bridge, location, total cost, engineer, fabricator, owner, date completed, data opened to traffic, span length, roadway width.

The American Institute of Steel Construction awards four prizes. Class A includes bridges costing more than $1,000,000, Class C bridges from $250,000 to $1,000,000, Class C less than $250,000, and Class D all movable bridges.

CIMATOOL'S NEW PLANT *for Better Service*

● With Cimatool's background, covering 33 years of successful service, the Company's new plant brings to tool and die making the highest standards of modern production—straight line handling with maximum efficiency. ● The Cimatool Plant is fully departmentalized, with such divisions as tool engineering and design, plaster and layout, machining, heat treat, welding, Kellering, barbering and tryout. With adequate overhead crane facilities, Cimatool is equipped to efficiently handle work weighing up to 50,000 pounds. ● Established in 1906, the Cimatool organization is broadly experienced in the design and manufacture of dies both large and small, and for all types of metal working operations. Always closely keyed to the customer's individual needs, Cimatool's expansion provides prompt and efficient tool and die service in all its branches.

THE CIMATOOL COMPANY

Dayton, Ohio, U.S.A.

DIEMAKERS • • TOOL MAKERS

MACHINE TOOLS

THIS WEEK IN WASHINGTON

. . . Business finds savings in President's reorganization plans "mere pittances" compared with Government costs . . . New NLRB member warns of "chiseling" against New Deal labor policies.

o o o

By L. W. MOFFETT
Washington Editor, The Iron Age

o o o

WASHINGTON—While White House plans for reorganization of Government branches have met with general approval because they point to possibly greater efficiency in administration, they fall far short of a thorough overhauling of a top-heavy, lumbering bureaucracy that has been built up in the name of emergency or some other disguise by the New Deal.

Complaint of business against waste and extravagance is only mildly assuaged by the regroupings and mergers proposed in either the first or second plan, the latter announced on Tuesday of last week. The plans, both of which have received Congressional approval, entail no important reduction in costs or in personnel and until there are slashes in both directions, criticism of the enormous cost of government administration will not be allayed. The President in announcing the first plan, outlined in THE IRON AGE of May 4, page 71, estimated it would result in a saving of between $15,000,000 and $20,000,000 annually. The second plan, he estimated will "ultimately" save $1,250,000 annually.

Mere Pittances

That relatively these sums, if they actually are saved, are mere pittances when measured against Government costs, is clear from the fact that interest alone on the Government debt is approximately $1,000,000,000 a year. The payroll of civil employees is estimated at about $1,700,000,000 annually. With tremendous costs like these business sees no prospect of any substantial tax relief and is unimpressed by talk of "economy" stated in terms of a score or so millions. Rather the desire is to see private industry released from hampering regimentation and excessive tax loads so it can absorb unemployment and advance to recovery. Further, it wants the Government, as quickly as it can, to abolish its multiplicity of useless agencies with their payroll supernumeraries whose functions chiefly are to harass business with endless questionnaires, investigations and other needless activities, and to propagandize the Administration through the medium of an army of publicity representatives.

To industry generally the principal shifts proposed in the second plan of reorganization were the abolition of the National Bituminous Coal Commission, whose functions were transferred to the Department of the Interior, and the consolidation of the foreign services of the Departments of State, Commerce and Agriculture into a single service unit under the State Department. For the Department of Commerce this means the transfer of about 100 commercial attaches, assistant commercial attaches, trade commissioners, assistant trade commissioners and clerks to the State Department. Elimination of the coal commission was widely hailed, except by the commissioners themselves, as a wholesome move. The commission, set up at the urging of John L. Lewis, and Senator Guffey of Pennsylvania, was steeped in politics from the outset. Constantly engaged in wrangling, it never accomplished any constructive work for the coal industry or its labor. While the commission now will lose its identity, its functions remain under the Department of Interior. There are many who feel that the whole organization and its operations should be wiped out.

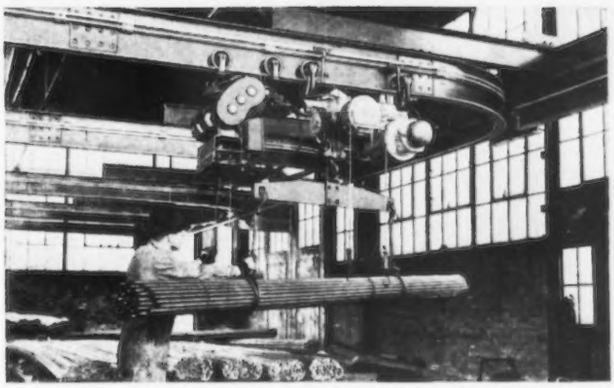
Business Indifferent

The reaction of business to the shifting of the Department of Commerce foreign service largely was one of indifference. There was some favorable comment on the ground that there would be increased efficiency through coordination of three foreign services into one unit. On the other hand there was complaint by those who still show interest in the Department of Commerce activities that the shift would sever business contact with the Department of Commerce rather than building up contact with the supposedly less business-minded State Department. Pretensions made in a publicity statement to the contrary it is reported that the Department of Commerce is considerably miffed that it is losing its foreign service.

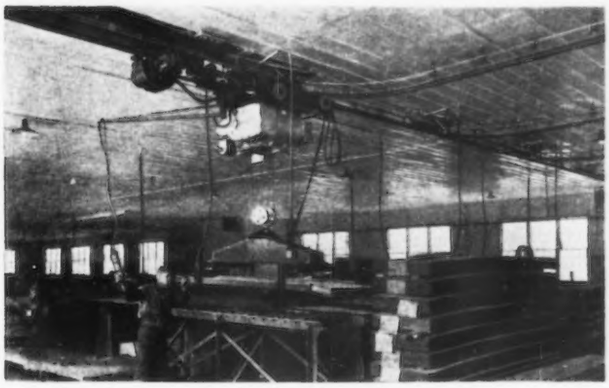
Haven For Sinecures

The propagandizing National Emergency Council was abolished in name also. Its main functions will be transferred directly to the White House where it may even intensify its press propaganda, press clipping exertions, radio, motion picture and other political publicity. In any event, like many other agencies, it will in fact, though not in name, remain a haven for sinecurists.

Immediately upon announcement of the plan to deprive the Department of Commerce of its foreign service reports were published that Assistant Secretary of Commerce Richard C. Patterson would resign. Informed sources said his proposed departure



MonoTractor and Hoist on 3-ton RailMaster System.

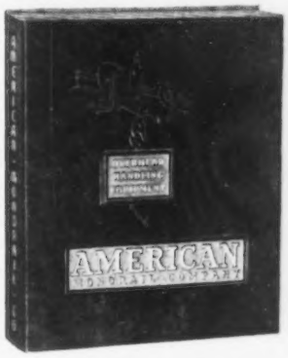


All movement of 3-ton load controlled by push-buttons.

Handling adds no value to a product unless it is co-ordinated with production as part of a process or by tying operations closely together.

A system, so designed, eliminates waste, speeds up the pace of production and invariably establishes lower cost records.

American MonoRail engineers apply these principles wherever possible. Extreme flexibility of standard equipment enables them to meet special requirements without extra cost. Engineering service is available at no obligation.



A 254 page book used as a technical reference for all data covering MonoRail Equipment will be sent on letterhead request.

The American MonoRail Co

13103 Athens Ave., Cleveland, Ohio

was not due to the shift of the department's foreign service. Subsequently a department statement denied that Mr. Patterson was planning to resign. Despite the denial it is reported that Mr. Patterson is about to wind up his services with the government to return to private life. At one time Mr. Patterson was on the staffs of the du Pont and White Engineering companies.

Press of private business was given by Gen. Robert E. Wood, vice-president of Sears, Roebuck & Co., as a reason for resigning as economic adviser to the Department of Commerce. In his letter of resignation to Secretary of Commerce Hopkins, General Wood expressed regret that Hopkins' illness made it impossible to confer more often with the Secretary.

In other quarters it was said that General Wood's resignation actually was due to administration rejection of a business tax and labor act revision program. General Wood urged proposals agreed upon last fall by the Business Advisory Council of the Department of Commerce. It was the understanding Secretary Hopkins himself had approved the tax program in substance, and in fact gave endorsement to its principles in his Des Moines, Iowa, speech last February. But recently Mr. Hopkins has been strangely silent on tax reform, declining to either affirm or repudiate his Des Moines address.

Germany Now Leading Producer of Aluminum

WASHINGTON — Germany's aluminum industry has undergone a phenomenal expansion in the past few years, according to a report from Consul Sydney B. Redecker, Frankfort-on-Main, made public by the Department of Commerce. Production of the metal in the Reich, which amounted to only 18,900 metric tons in 1933, increased to approximately 180,000 tons in 1938, the latter figure including the output of Austrian plants. Germany is now the world's leading aluminum producer exceeding the United States by a substantial margin, the consul reported. Approximately 75 per cent of German aluminum production is accounted for by one Government-owned concern, the Vereinigte Aluminium Werke A. G., according to the report. In 1937 this company had a productive capacity of 100,000 tons of aluminum but this capacity was considerably enlarged during the past year and further notable expansion is expected to occur in 1939.

Why TNEC Held Beryllium Hearings Puzzles Washington

WASHINGTON — Why the anti-monopoly committee selected the beryllium industry to illustrate the difficulties faced by new enterprise in exploiting a new material puzzled many observers last week after hearing two days of testimony which developed conflicting opinion as to the value of the metal for wartime purposes and whether the infant industry is encountering the difficulties to which Government officials have referred.

Back of the inquiry, according to some reports, is Leon Henderson, secretary of the Temporary National Economic Committee, with whom representatives of the industry are said to have conferred before being invited to Washington. Mr. Henderson, who has been named to the Securities and Exchange Commission by the President, is understood to have urged other members of the TNEC to undertake the two-day inquiry.

Testimony developed at the hearing showed that there are two competing companies in the industry—the Beryllium Corp., of Reading, Pa., and the Brush Beryllium Corp., of Cleveland. The company in Reading, testimony showed, operates as a licensee under German patents while the Cleveland firm has developed its own manufacturing process.

Proposals from Europe

Dr. Charles B. Sawyer, president of the Brush Beryllium Corp., asserted that European beryllium representatives had urged him to "cooperate" with his only other competitor and that they had pointed to five British companies which had increased dividends by raising prices 30 per cent through "cooperation." Dr. Sawyer told the committee that he had discouraged such a combination and was not interested in the proposition.

The American Brass Co., a subsidiary of the Anaconda Copper Co., discontinued in 1935 as a customer and developer of the Beryllium Corp. because beryllium-copper was unprofitable and competed with phosphor bronze, according to Andrew J. Gahagan, president of the Beryllium Corp. Subsequent statements by representatives of the American Brass Co., however, showed that they planned to continue in the beryllium fabricating business.

Members of TNEC developed testimony at the hearing that it was the custom in the metal fabricating industry to practice "price leadership" and that prices on beryllium copper products made by the American Brass Co., and the Riverside (N. J.) Brass Co. showed an almost identical rise from 1933 to 1938 while during the same period there was a reported decline in the cost of raw material.

John A. Coe, Jr., general sales manager, of the American Brass Co., denied his company was price leader, asserting that in many instances his concern follows the prices of competitors and that there is a general following of price policies in the industry.

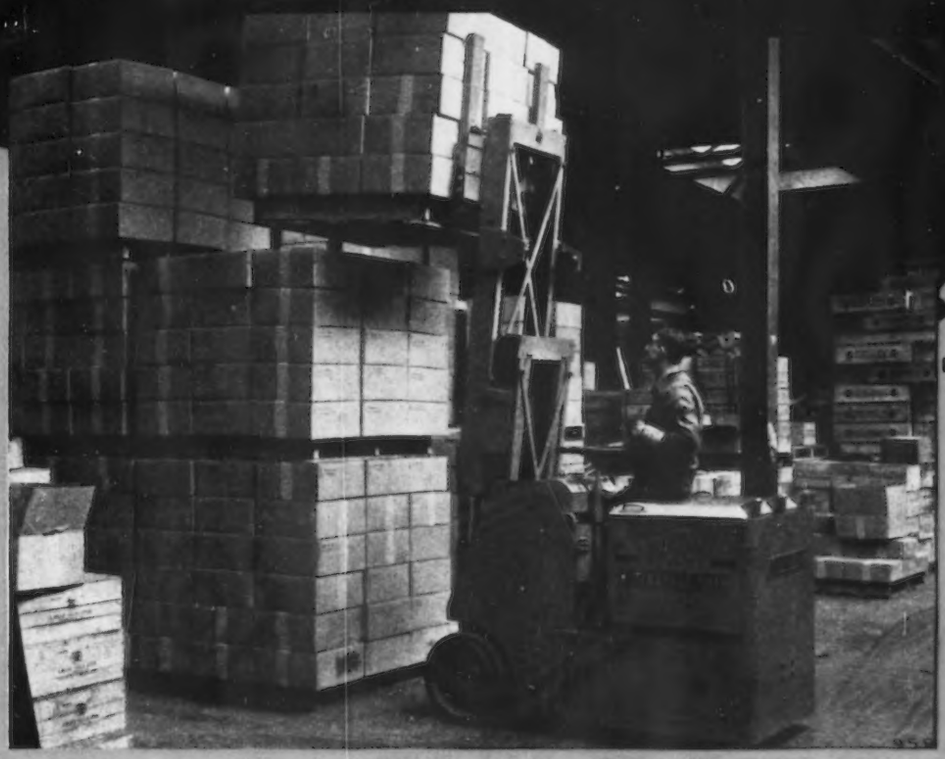
"You are not in danger here," Chairman O'Mahoney said in soliciting the information. "Nobody is going to prosecute you. It is an important matter for the people of this country and for the development of the industry in this country that business executives speak frankly to the members of Government, otherwise we can not legislate."

Germany Reported Progressing

Reports of progress made by German developers of beryllium and other alloys, which have been the frequent subject of discussion by Congressional committees and War Department officials, have been discounted from time to time but testimony before the TNEC last week was that Germany has made rapid strides in the use of beryllium in airplane motor bushings and that the future of aviation depends largely on beryllium nickel.

Dr. Ferdinand A. Kertess, American representative of Deutsche Gold-Und Silber-Scheideanstalt, minimized the military importance of beryllium, however, pointing out that the metal is not now being produced in Germany to any great extent. In view of the reported advances made in the German aircraft industry, some observers regarded the testimony as indicative that another alloy has been developed in Germany whose qualities represent an improvement over beryllium alloys.

Other testimony introduced at the two-day session indicated that Great Britain regards the metal as of great strategic importance and has expressed fear that beryllium might prove invaluable if its tin supply in the Malay



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Each UNIT LOAD with this NEW "AUTOMATIC" is a PAYLOAD . . . Each TRIP is an economical TRIP, from RECEIVING to STORAGE to PROCESS back again to STORAGE or SHIPPING.

Each STORAGE operation with this New "AUTOMATIC" REDUCES HANDLING COSTS. Commodities do not require rehandling—the UNIT LOAD is simply hoisted—stacked double or triple to use ALL available storage space right up to the ROOF TRUSSES.

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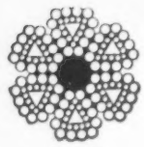
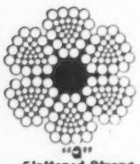
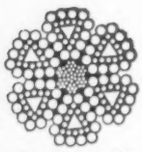


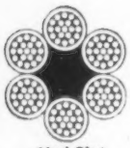
Style B Flattened Strand



"9" Flattened Strand



Wire Rope Center



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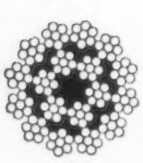
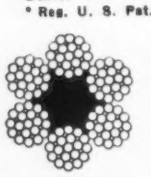
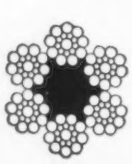


18x7 Non-Rotating



8x19 Filler Wire



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Straits and Bolivia might be cut off in the next war.

New Industry's Difficulties

In announcing the hearing on beryllium, described as an element which can be combined with copper or nickel, or other metals to produce alloys possessing qualities of hardness, lightness and strength, Justice Department officials said:

"The evidence as to beryllium may be interesting to the committee because it will serve to illustrate some of the difficulties which arise in the initial stages of the development of a new industry. Some of the material which will be presented will show that because of the international scale on which business enterprises are now conducted, and because of the size and power of business units operating in particular fields, the problems which men face today when they attempt to build up a new industry are much more complicated than were the problems existing in a similar situation a half-century ago."

Standards Bureau Tests Sheet Steel Flooring

WASHINGTON—As part of the program on the structural properties of low-cost house constructions, the Bureau of Standards tested six specimens of sheet-steel floor constructions submitted by the Wheeling-Corrugating Co., according to Technical News Bulletin, a Bureau publication. These consisted of sheet-steel, channel-shaped joists, assembled by welding the wide, overlapping upper flanges to form a continuous sheet-steel subfloor to which a hardwood-finish floor and a plaster ceiling were attached.

The specimens were subjected to transverse, impact, and concentrated loads, simulating the actual loads applied to the floor of a house. For each of these loads three like specimens were tested, the concentrated load tests being made on undamaged portions of the specimens used for the impact tests. The deformation under load and the set after the load was removed were measured for uniform increments of load, except for concentrated loads, for which the set only was determined. The strength under transverse load was also determined. The results are presented graphically and in a table in Building Materials and Structures Report BMS 15, which has just been released. Copies are obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 10c. each.

Hopkins Will "Highlight" Foreign Trade Week

WASHINGTON — Secretary of Commerce Harry L. Hopkins, who last week was critical of business gloom reflected by the United States Chamber of Commerce at its annual meeting, was planning this week to team up with the chamber in its sponsorship of National Foreign Trade Week.

According to a press statement released by his Department, Secretary Hopkins will "highlight" observance of the designated week—May 21 to May 27—by speaking at a dinner at the New York World's Fair the evening of May 25.

The secretary, who has been subjected to undercover criticism within his department for his advocacy of President Roosevelt's plan to transfer the Department's Bureau of Foreign and Domestic Commerce to the State Department, will deliver his address over a nation-wide radio hookup. The program is planned in the interest of trade promotion.

Purchase of Bethlehem Shipyard by U. S. Approved

WASHINGTON — The House Naval Affairs Committee has reported favorably on a bill authorizing the Navy Department to negotiate with the Bethlehem Steel Co. for the purchase of the Hunter's Point dry dock at San Francisco at a price of $4,000,000. After turning down an amendment which would have authorized the condemnation of the dry docks, the committee approved the inclusion of a provision empowering the department to proceed with the construction of its own facilities at a cost not exceeding $6,000,000 if negotiations are not satisfactorily concluded within 90 days after passage of the bill.

Perry, Ryerson Elected Steel Institute Directors

W. A. IRVIN, former vice-chairman of United States Steel Corp., and L. E. Block, chairman of Inland Steel Co., have been elected honorary vice-presidents of American Iron and Steel Institute, according to an announcement by the institute. Their resignations as directors of the institute were also announced.

J. L. Perry, president of Carnegie-Illinois Steel Corp., and E. L. Ryerson, Jr., vice-chairman of Inland Steel Co., have been elected to the board of directors of the institute.

A YALE STORY OF SAFETY

That's what happens every time a load is lowered on a Yale Hand Lift Truck—Check and Double Check! For the Yale Release Check has a concentrated cushioning action that makes it doubly efficient —a safety factor that always protects load, truck, operator and floor.

In order to make this check as perfect as possible, Yale engineers have considered every mechanical factor. That's why it's placed in the center of the truck where load strains are uniformly balanced—and is protected from injury by a heavy channel cross member.

It also features a high carbon ground piston rod guided in a bronze bushing. This is one piston rod which will not buckle! In addition, there is an extra capacity oil reservoir with an automatic oil seal that prevents leakage. Once the oil is in, it stays there. And as a final indicator of the Yale Release Check's quality manufacture, there is the highly precisioned automotive type piston ring.

With this check on the job the load is never dropped—It's gradually lowered!

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No "Chiseling Away" of New Deal Labor Policies, Leiserson Warns

WASHINGTON — William M. Leiserson, new NLRB member who was named by President Roosevelt to succeed Donald Wakefield Smith, told the Senate Education and Labor Committee last week that the Administration's broad labor policy should not be "chiseled away" by casual revision of the Wagner Act.

Mr. Leiserson, whose appearance before the committee was unannounced, grouped the Wagner Act with the Norris-La Guardia Anti-Injunction Act and the Railroad Labor Act as the foundations of the Administration's labor policy and held that to weaken one of these laws through revision or repeal would be to seriously impair the prevailing labor policy.

"Fairness and justice in labor relations cannot be achieved or maintained without regarding the property rights of employees every bit as sacred as the property rights of employers," the witness told the committee.

Pressman Objects

As the hearing on the Wagner Act entered their fourth week, it was disclosed that representatives of the NLRB and the AFL had met in a surprise conference reportedly for the purpose of working out compromise amendments of the law. This move, which subsequently collapsed, was assailed by CIO Counsel Lee Pressman as an attempt by the AFL to make "a back-door deal with the National Labor Relations Board."

Said AFL President William Green: "We have no intention of modifying our amendments."

Later in the week the National Council of Independent Unions, inquiring as to what is to be done to protect 40,000,000 employees unaffiliated with either AFL or CIO, endorsed many of the provisions in the AFL's proposed amendments of the Wagner Act and asked to be included in any conference between labor groups and the NLRB aimed at working out a revision of the law.

The Council said in a letter to Chairman Thomas of the Senate committee that other labor groups represent only a small part of the working population, charging that the CIO had frowned on the conference move because it has been able to exist "by virtue of a pro-CIO labor board."

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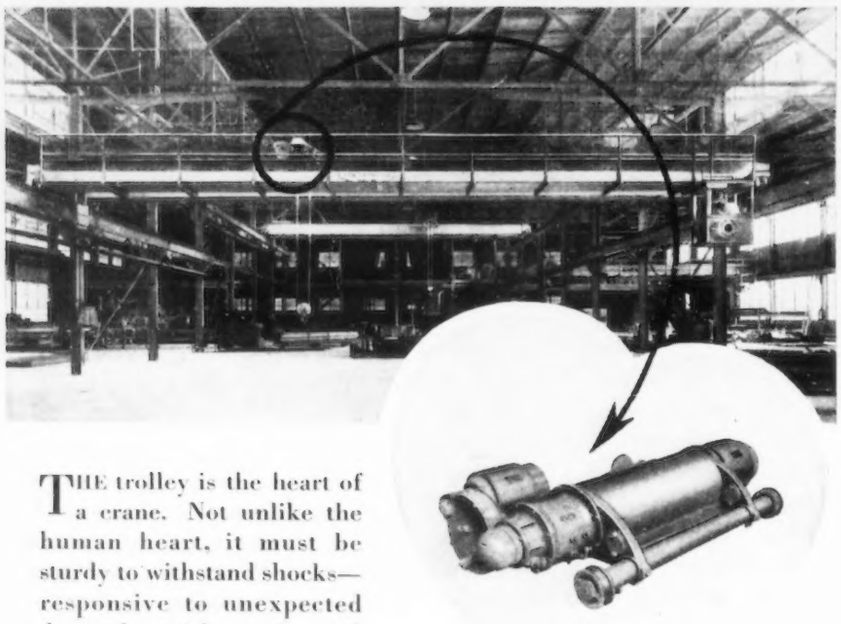
Electric Traveling Cranes
CAPACITIES 1 TO 450 TONS



THE trolley is the heart of a crane. Not unlike the human heart, it must be sturdy to withstand shocks—responsive to unexpected demands—with stamina and endurance for hard work day after day.

A few of the features that contribute to the long life and trustworthy service of Shepard Niles crane trolleys are—load carrying frame of steel—balanced drive gearing—automatic oil bath lubrication and complete enclosures for all vital parts.

A detailed description of the heart of a Shepard Niles crane is given in Bulletin No. 123. A copy is yours for the asking.

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Italy Finds Tin Ore in East Africa

WASHINGTON — Deposits of tin ore are reported to have been found in Italian East Africa, according to a report from Consul Lester L. Schnare, Milan, made public by the Department of Commerce. The deposits are located in Italian Somaliland, about 12 miles inland from the port of Bender Cassim, on the Gulf of Aden. The extent of the deposits is not known as yet, but it is reported in Italy that shafts are being sunk and a plant for the extraction and concentration of the ore is being erected. Tests of the ore taken from the shafts, the report said, seem to confirm the view that the deposits will increase in value as the shafts are deepened.

Invention— The Foundation Of New Industries

"THE underlying problem confronting American business to remedy unemployment," says H. A. Toulmin, Jr., author of the forthcoming book, "Patents and the Public Interest," "is the need for new industries. This is not the first time in the history of the United States that our large industries have grown to maturity without new industries springing up alongside of them to fill the gap that is left by this growth.

"In 1870 the railroad industry had grown rapidly and then flattened out during that period. Likewise, during our time, the revolution in transportation seems to be complete and the automobile industry has reached a similar maturity. A great deal is said about the lack of courage on the part of capital in investing its funds.

"The real answer is not a question of courage, but it is a question of opportunity. In the vigorous nineteen-twenties there were numerous new opportunities in new industries for the investment of private funds. The automobile industry was just beginning to grow. The radio industry, the domestic electric refrigeration industry, the aviation industry, our chemical industry, which had just gotten its start during the World War, and hosts of other similar great engineering developments for providing fruitful fields for the profitable employment of capital.

"Our problem now is not an economic one or a political one in the sense that we have a complicated economy that cannot operate because of its complexity. The real trouble is relatively a simple one. What we need and must have are inventions as a foundation for new industries for the outlet for the profitable employment of private capital."

Accidents Are "Operating Mistakes," C. M. White Says

CHICAGO—"Accidents are operating errors, operating mistakes, and are too frequently the result of disobedience of well recognized orders and practices," C. M. White, vice-president in charge of operations, Republic Steel Corp., said in an address before the 17th annual Midwest Safety Conference in Chicago last week.

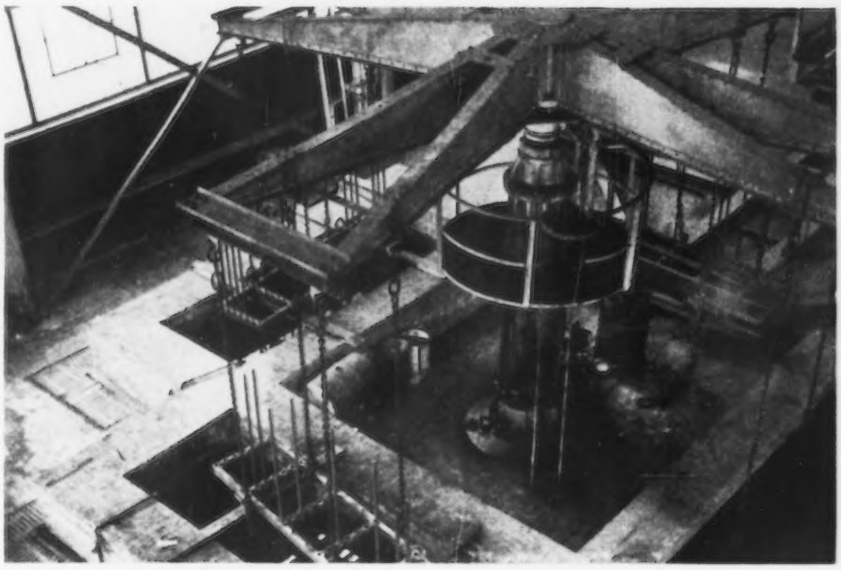
"We do not tolerate the disobedience of operating instructions which result in waste and inefficiencies," Mr. White continued, "so why should we tolerate failure to obey or to enforce rules and instructions for safety?"

He pointed out in his discussion of "Safety in Industry Today," that the workers who have the most accidents are those whose work is poorest, whose attendance record is least perfect, and whose reaction to supervision is slowest.

Truscon Wire Mesh Plant Begins Operations

BIRMINGHAM — The new wire mesh plant of the Truscon Steel Co., at the Gadsden, Ala., works of Republic Steel Corp., began operations last week. J. K. Rodgers, previously manager of the Birmingham fabricating shop and warehouse, has been transferred to Gadsden as manager of the wire mesh plant.

Three Section BASOLIT PICKLING TANK



installed August 1937 with a Mesta pickler in one of the large new sheet mills at Cleveland. Each tank is 20′ long, 6′ wide, 9′ deep.

Construction is brick-veneered concrete shell with inner lining of acid proof brick and acid proof jointing cement BASOLIT —also available in combination with rubber lined steel tanks.

The installation illustrated is one of the many hundreds where BASOLIT has contributed toward long life and efficient operation of modern pickling equipment.

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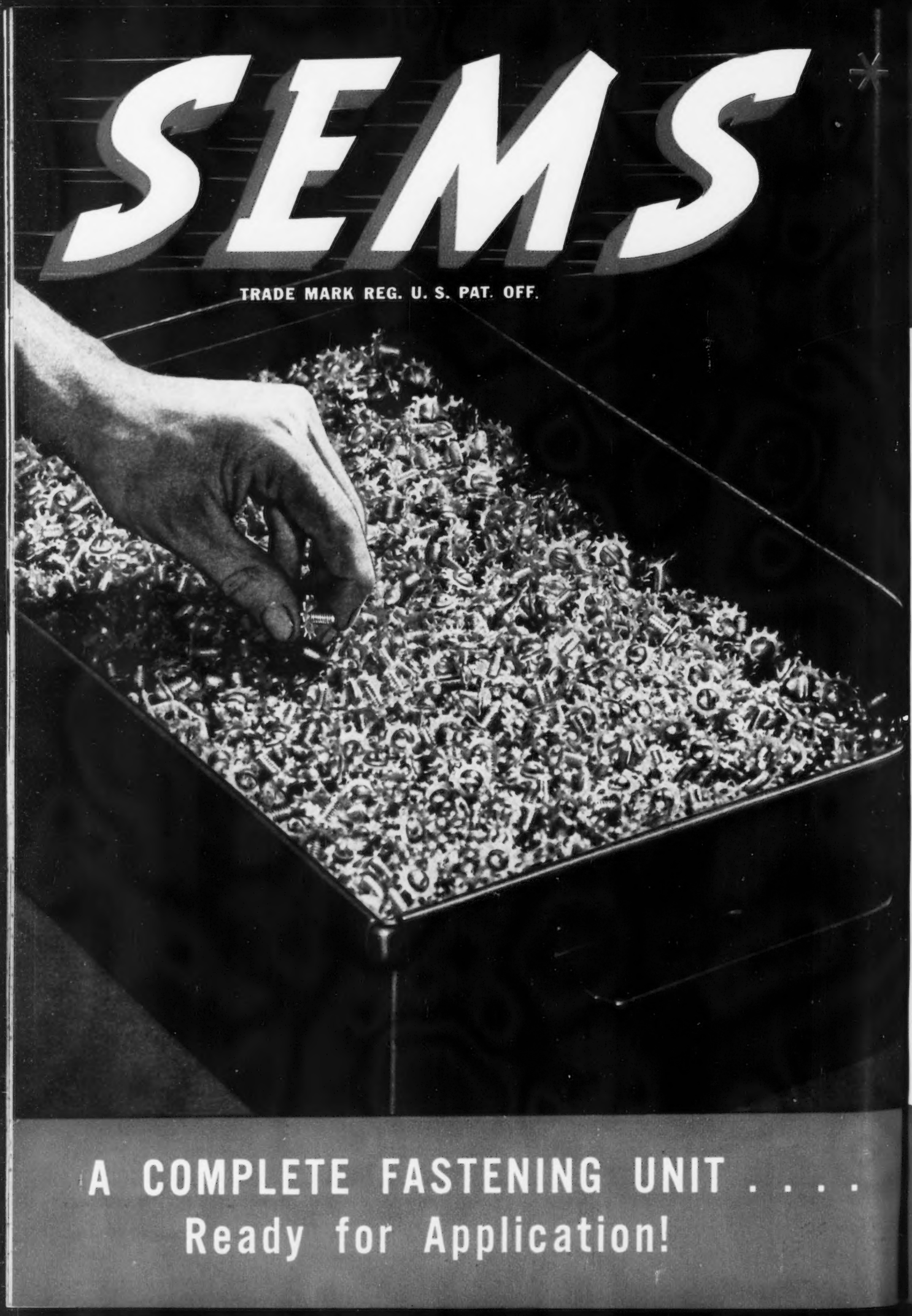
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TRADE MARK REG. U. S. PAT. OFF.
A COMPLETE FASTENING UNIT . . . .
Ready for Application!

Pre-Assembled SHAKEPROOF Lock Washer and Screw

SAVE TIME . . . SAVE LABOR . . . SAVE MONEY

* SEMS is the registered trade-mark of Illinois Tool Works, manufacturers of Shakeproof Lock Washers. Only genuine Shakeproof Lock Washers are used in the manufacture of SEMS.

Save with SEMS—the proven Shakeproof fastening unit that immediately cuts production costs! SEMS bring you, in a single fastening unit, both lock washer and screw—pre-assembled and ready for application. SEMS save the time and trouble of putting lock washers on screws and stop the costly waste of dropped and wasted lock washers. SEMS make ordering easy by supplying both products as one unit, and keep inventories of both screws and lock washers automatically in balance. SEMS assure lowered labor costs and overhead charges because their use speeds up assembly—they aid control of product quality because each screw is provided with the correct size and type of lock washer—and no screw can be driven without a Shakeproof Triple-Action Lock Washer to protect it from vibration.

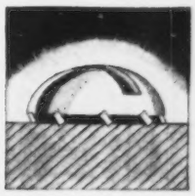
also available with PHILLIPS Recessed Heads

LOOK AT THESE IMPORTANT BENEFITS

Lock Washer and Screw, pre-assembled and delivered as one unit.

Saves time and labor of putting lock washers on screws.

The correct size and type of Lock Washer for each size and type of screw.



No screw can be applied without Lock Washer to protect against vibration.

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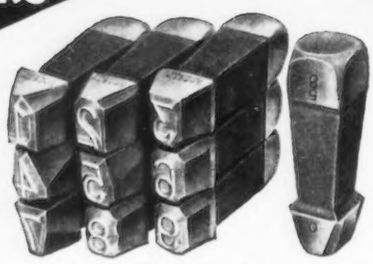

Safety Wedge Grip Design

Cunningham Safety Steel Stamps will keep your workmen safe, and at the same time will reduce your marking costs.

Manufactured from the world's strongest commercially-made tool steel, all Cunningham stamps are guaranteed against mushrooming and spalling. They are 50% stronger than ordinary steel stamps, and they will give you twice as many impressions as other stamps.

The patented Wedge-Grip design permits deeper and better markings with less work, and protects the operator's fingers from foul hammer blows. It makes possible the use of stamps which handle more easily, because they are 25% lighter.

Write for illustrated literature about these and other Cunningham marking devices.

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. . . PERSON

R. S. AHLBRANDT has been appointed district sales manager of the Pittsburgh district, Allegheny-Ludlum Steel Corp., succeeding J. R. KUMER, JR., who has been appointed assistant manager of stainless bar and wire products. Mr. Ahlbrandt has been with the company since 1934, having worked at the Watervliet, N. Y., plant and the Cleveland district sales office.

Mr. Kumer started with Allegheny-Ludlum in 1926 in the steel foundry sales department, and in 1932 was placed in charge of the general sales department, Pittsburgh territory, which position he held until his present appointment.

HOWARD M. GIVENS, JR., has been appointed assistant general manager,

R. S. AHLBRANDT

tool steel sales. He previously was assistant manager of sales, stainless bar and wire products. He was with the Midvale Co. of Philadelphia from 1931 to 1936 in the research laboratories, rolling mills, and general sales department as a tool steel salesman. Mr. Givens joined the old Allegheny Steel Co. as a salesman in the stainless bar and wire products department which position he held up to the time of his new appointment. He will be located at Watervliet, N. Y.

❖ ❖ ❖

JAMES A. SARGENT, assistant vice-president, Sharon Steel Corp., Sharon, Pa., who has been located in Detroit

ONALS . . .

the past two years in a special sales capacity, returns to the general staff at Sharon. He joined the company in 1930 as superintendent of the cold rolled strip mills and shortly after became associated with the sales department.

HOWARD S. GIER has been appointed district manager of sales in the Detroit office. He has been with the company since 1923 having spent several years in the mills and general office and later in charge of the service department. Prior to his present ap-

J. R. KUMER, Jr.

H. M. GIVENS, Jr.

Through the smoothly flowing departments of Gibson's plant go springs, clips, small stampings, washers, wire forms and countless other parts whose success involves spring action. If you have similar parts under consideration, let Gibson's experience in spring materials come to your aid.

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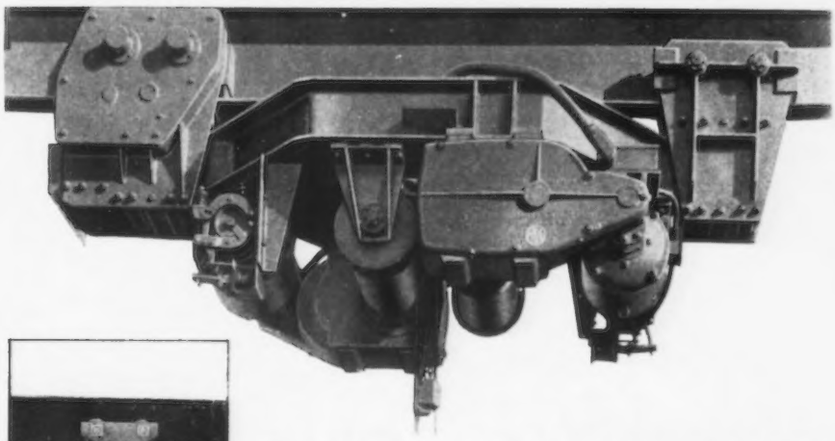
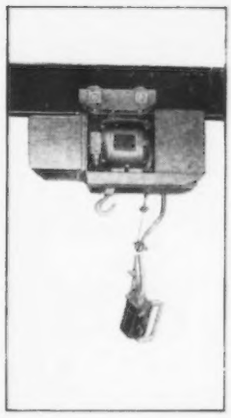
DIVISION OF ASSOCIATED SPRING CORP. 1800 CLYBOURN AVE., CHICAGO, ILL.

SPRINGS • WIRE FORMS • SMALL STAMPINGS





FAMILY RESEMBLANCE!

It may be a *little* R & M hoist playing with pounds . . . or a *big* R & M hoist toying with tons. Makes no difference—they belong to the same family. Same steel backbones, same precision-built power plants, same heat-treated, sure-running, roller-bearing mechanism, same reliable motor and control.

Let us tell you about the R & M hoist that's *right* for the job you have in mind now.

ROBBINS & MYERS, INC.

HOIST AND CRANE DIVISION · SPRINGFIELD, OHIO

pointment, he was assistant district sales manager in the Detroit office.

A. A. KEALLY has been appointed assistant vice-president with headquarters in Detroit. He formerly was district manager in that office, having served in that capacity since 1917.

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S. J. HORRELL has been appointed assistant sales manager, power piping division of Blaw-Knox Co., Pittsburgh. Mr. Horrell spent the past nine years with Grinnell Co., Providence, R. I., in the design and sale of pre-fabricated piping for high pressure-high temperature service.

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HARRY F. DEVENS, chairman of the board, and JOHN JENKINS, vice-president and secretary, Oliver Iron & Steel Corp., Pittsburgh, have retired from active service, although Mr. Jenkins, who has been with the company for over 52 years, retains his directorship.

New officers elected are as follows: THEODORE F. SMITH, president; H. O. REA and J. C. REA, vice-presidents; L. E. UHRICH, secretary and controller; W. F. ROLL, treasurer; J. P. ROCHE, assistant secretary; and J. H. LAMMERT, assistant treasurer.

S. J. HORRELL

WALTER GEIST

WALTER GEIST has been appointed vice-president of Allis-Chalmers Mfg. Co., Milwaukee. Mr. Geist will continue to supervise the personnel of all district offices of the company, domestic and foreign as well as direct the advertising and sales policies for the firm.

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GORDON F. HESS since 1931 assistant manager of sales, alloy steel division of Republic Steel Corp., Massillon, Ohio, has been appointed sales manager of the Houston district, effective June 1. Mr. Hess entered the steel business in 1917 in the metallurgical department of the Federal Steel Co., which later went into Central Alloy Steel Co. and is today a part of Republic.

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DR. ZAY JEFFRIES was honored May 12 at a luncheon in the Union Club, Cleveland, for his election to membership in the National Academy of Sciences. Dr. Jeffries, a metallurgist, became chairman of the Carboloy Co. in 1936 after serving four years as its president. Associates and former associates of his at Case School of Applied Science, Cleveland, the Aluminum Co. of America, and the Nela Park Works of General Electric Co. were among those participating in the luncheon.

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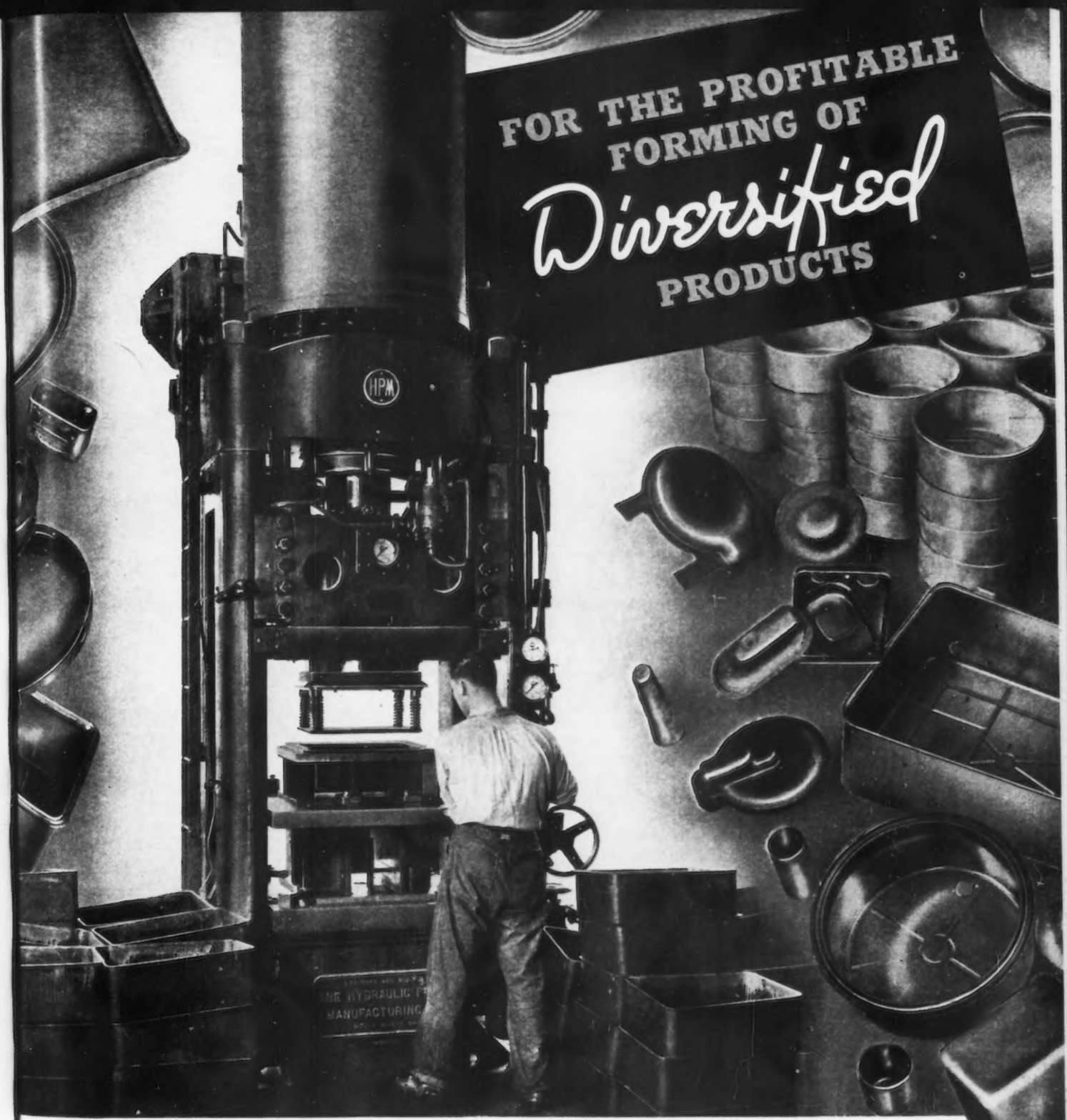
WILLIAM E. FOWLER will become general traffic manager of Youngstown Sheet & Tube Co., Youngstown, effective June 1, succeeding A. C. GRAHAM, who has voluntarily retired



In some cases successful press performance cannot be measured on the basis of mass production requirements. **FLEXIBILITY** in changing from one job to another quickly where small production runs are involved is equally as important. ● This is especially true at Bailey Meter Company, Cleveland, Ohio. Production here is unusually diversified . . . runs are small . . . yet it is gratifying to know that these runs, no matter how complicated the forming operation . . . how deep the draw, can be handled in minimum time with maximum economy. ● This is typical of H-P-M FASTRAVERSE PRESS performance with its Hydro-Power closed circuit Operating System. It assures high speed for mass production requirements . . . flexibility where production is diversified and runs are short . . . plus a degree of control over every press movement only an H-P-M FASTRAVERSE PRESS can possibly provide. Call in an H-P-M Engineer to study your heavy pressure production problem. THE HYDRAULIC PRESS MFG. COMPANY, MOUNT GILEAD, OHIO, U. S. A. ● District Offices: New York, Detroit, Chicago. Representatives in Principal Cities.

HPM

FASTRAVERSE PRESSES

With Their Exclusive CLOSED CIRCUIT System

from active service owing to illness. Mr. Fowler has spent the last 25 years in various phases of railroad operation and traffic problems. In accepting the new position he will retire from the presidency of the Pittsburgh, Lisbon and Western Railroad and the Youngstown & Suburban Railway. Mr. Graham, who has been with Youngstown Sheet & Tube Co. for more than 37 years, will be available in a consulting capacity as far as his health permits.

M. J. O'Neill, who joined the Monarch Governor Co. of Detroit last December as director of sales after serving for 18 years in the parts and accessory division of Ford Motor Co., has been appointed vice-president in charge of sales for Monarch Governor.

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C. C. Carlton, vice-president of the Motor Wheel Corp., Lansing, Mich., was named president of the Automotive Parts and Equipment Manufacturers Association for his sixth consecutive term at the annual meeting held in Detroit recently.

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E. C. Wickersham has resigned from the sales department of the Howell Electric Motor Co., Howell, Mich.,

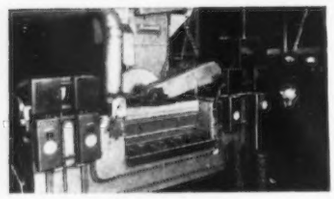
L. E. OSBORNE, whose promotion to the managership of the manufacturing and engineering merchandising division of Westinghouse Electric & Mfg. Co. was announced in these columns last week.

WALTER K. BAILEY who, as announced on page 110 last week, has been made sales manager of the Warner & Swasey Co., Cleveland.

How's this for Customer Satisfaction?

10 Concerns Ordered 5 TO 35 WHEELABRATOR AIRLESS ABRASIVE BLAST MACHINES IN THE LAST FIVE YEARS!

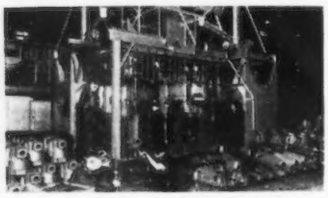
59 OTHERS ORDERED 2 TO 5 MACHINES EACH



Cleaning Ring Gears in a Wheelabrator Tablast

THINK of it!—in only five years' time nearly 700 WHEELABRATOR airless abrasive blasting machines have been installed wherever metals are cleaned or finished. The following concerns have installed from 5 to 35 machines each, and 59 others have ordered from 2 to 5 machines—a record that speaks for itself.

Cleaning Forgings in a 36" x 42" Wheelabrator Tum-Blast



Cleaning Tractor Cylinder Blocks in a Wheelabrator Special Cabinet

	No. of Machines
General Motors	35
International Harvester Co.	33
Ford Motor Co.	32
Magnus Company	13
Chrysler Corp.	13
National Mall. & Stl. Cstgs. Co.	11
Borg-Warner Corp.	11
Kelsey-Hayes Wheel Co.	10
Campbell, Wyant & Cannon Fdry.	9
General Electric Co.	9
Amtorg Trading Corp. (U.S.S.R.)	7
Timken Roller Bearing Co.	7
Eastern Malleable Iron Co.	6
Associated Spring Co.	5
American Brake Shoe & Fdy. Co.	5
Allis-Chalmers Mfg. Co.	5

THE American FOUNDRY EQUIPMENT CO. 510 S. BYRKIT ST. MISHAWAKA, IND.

WHAT TROUBLE SPOTS IN EVERY STEEL PLANT CALL FOR THIS REFRACTORY?

It's no longer news that "Carbofrax", the "dollar firebrick", is being used economically in the trouble spots of steel plant boiler furnaces. But to those who regard "Carbofrax" products as highly specialized, it may be real news to learn that there are many different uses for this remarkable silicon carbide refractory already established in steel plant operation. Wherever severe abrasion, bad thermal shocks, extremely high temperatures or severe clinker adhesion is encountered, or where high heat conductivity is required in a refractory . . . "Carbofrax" will more than justify its higher initial cost. Listed below are eight important trouble spots where "Carbofrax" is making worthwhile savings. Our representative will be glad to discuss these uses of "Carbofrax" in detail.

1. *Clinker zone of boiler settings.*
2. *Port linings in producer gas fired open hearths.*
3. *Lower side wall in soaking pits.*
4. *Heat transfer elements of recuperators.*
5. *Skid rails in heating furnaces.*
6. *Burner extension tubes in soaking pits.*
7. *Linings of blast furnace hot blast mains.*
8. *Muffles and hearths for heat-treating furnaces.*

REFRACTORY CARBORUNDUM PRODUCTS

THE CARBORUNDUM COMPANY, REFRACTORY DIVISION, PERTH AMBOY, N. J.

REG. U. S. PAT. OFF.

District Sales Branches: Chicago, Philadelphia, Detroit, Cleveland, Boston, Pittsburgh. Agents: McConnell Sales and Engineering Corp., Birmingham, Ala.; Christy Fire Brick Company, St. Louis; Harrison & Company, Salt Lake City, Utah; Pacific Abrasive Supply Co., Los Angeles, San Francisco, Seattle; Denver Fireclay Co., El Paso, Texas.

(Carborundum and Carbofrax are registered trade-marks of The Carborundum Company)

to become assistant sales manager of the Leland Electric Co., Dayton, Ohio.

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OLIVER E. MOUNT, secretary and treasurer, American Steel Foundries, Chicago, has been appointed chairman of the workmen's compensation, health and safety committee of the Illinois Manufacturers' Association. J. L. EARLYWINE, of Carnegie-Illinois Steel Co.; H. G. HENSEL, of Youngstown Sheet & Tube Co., and DR. V. S. CHENEY, of Armour & Co., have been appointed vice-chairmen. There are 53 other members of the committee.

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C. K. MCCRACKEN, formerly with the American Bridge Co. in its Detroit office, has transferred to the New York office of the United States Steel Products Co.

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W. D. WISE has been named advertising manager of Fruehauf Trailer Co. Mr. Wise joined the Fruehauf organization in 1931 as a member of the sales department. He was transferred to advertising work in 1933.

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R. W. EICHENBERGER, vice-president of the Robins Conveying Belt Co., New York, formerly acting as manager of the company's Chicago office, has been transferred to the New York office, where he will collaborate in general sales management with H. VON THADEN, also a vice-president.

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J. W. SAVAGE, for several years identified with distribution and commercial research problems of the General Electric Co.'s appliance and merchandise department, has been named assistant to C. E. WILSON, executive vice-president.

ARTHUR C. ALLSHUL, plant manager at Philadelphia for Joseph T. Ryerson & Son, Inc., who was honored by a dinner planned by fellow employees on his completion of 40 years of service with the company.

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A. W. KELLER, for the past nine years identified with the sales department of Maas & Waldstein Co., Newark, N. J., has been appointed technical sales representative.

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EDWARD V. HEGG, who has served the Buffalo Foundry & Machine Co., Buffalo, for more than 10 years in sales and engineering capacities, has been promoted to the managership of the company's New York office.

GOOD-BYE TO THE BLUNDERBUSS

A few hundred years ago, a blunderbuss was a well-thought-of weapon. You poured in a few handfuls of powder and any pieces of old lead you happened to have around the house. Then you closed your eyes and pulled the trigger—and hoped you'd hit something.

Today the blunderbuss is out. In every field, accuracy has replaced happenstance. And nowhere is this truer than in the exacting field of modern metal cleaning operations.

Wyandotte Metal Cleaners offer to industry specialized efficiency in keeping with the times. They're not blunderbuss cleaners. Every one of them is developed to do a particular job quickly and well—and to save every fraction of a cent possible on the operation.

If you're not using Wyandotte Metal Cleaners, it will be to your advantage to find out about them. We will be glad to send an expert Wyandotte Service Representative to call.

THE J·B·FORD COMPANY
WYANDOTTE MICHIGAN
DISTRICT OFFICES IN 26 CITIES

Trade Groups Not Price-Fixers, Steel Warehouse Men Are Told

CHICAGO — Discussions of industry problems keynoted the 30th annual convention of the American Steel Warehouse Association, which was held here this week at the Drake Hotel.

The function and value of a trade association, particularly the steel warehouse association, was the subject undertaken by A. Oram Fulton, president of the association, and president of Wheelock, Lovejoy & Co., Cambridge, Mass. Mr. Fulton pointed out that the duties of a trade association, are not, as many think, to fix prices or in some way to control prices, but to keep abreast of a multitude of happenings so as to be able to inform members.

Some of the activities receiving attention from 110 successful associations, in the order of their importance, are; relations with customers, statistics, sales promotion and market development, public relations, relations with other associations, Government relations, relations with sources of supply, cost accounting, employee relations, business practices, and examination of credits. Price filing is specified by only two associations, Mr. Fulton said, and the steel warehouse group is not one of these.

Outlines Field of Service

Dwelling on his own organization, Mr. Fulton told of the many activities covering the entire field of steel service, including alloy steel, boiler tubes, cold-finished steel, flat-rolled products, foreign steel, hot-rolled products, mechanical tubing, stainless steel, statistics, tool steel, committee on taxation and insurance, and the important mill relations committee.

About 80 per cent of the companies in the industry belong to the association, according to Mr. Fulton, and the four largest members supply 26.8 per cent of the total income. An open price system is not maintained by the organization, which consists of over 300 active members in 18 chapters throughout the country, with more than 50 associate members.

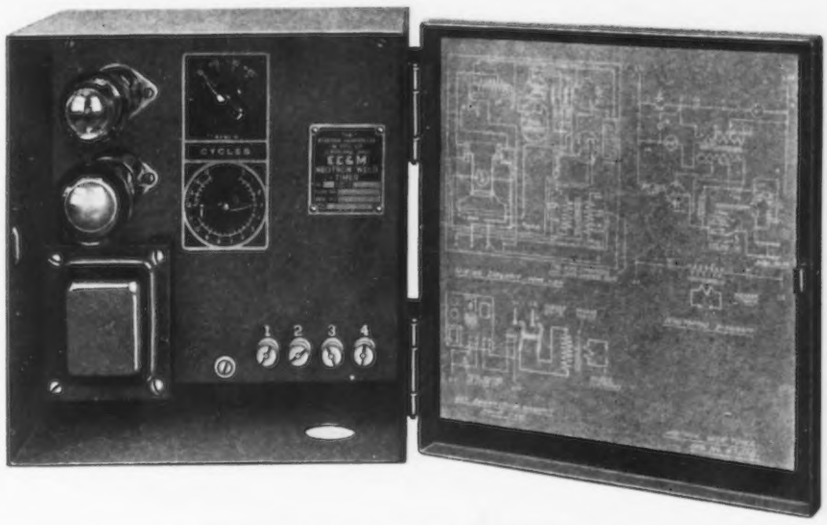
Mr. Fulton advised his audience to be ". . . proud of your position in the industry, both of your company, your competitors, and your association, which welds them together. You must never doubt the justification for your business as a distributor. You know that our industry distributes approximately 14 per cent of all the steel manufactured in this country to over 200,000 consumers, and that we render constructive, important and absolutely necessary service. It should be our constant effort to protect and advance the economic security of the warehouse and to obtain for it its rightful place in the distribution of steel."

In the development of any industry, the trade association should be looked to for leadership in informing members of past history, developing the present, and planning for the future, said Mr. Fulton.

A number of charts and other data were presented by Walter S. Doxsey, executive secretary of the association, showing that substantial costs are incurred by rendering the variety of ser-

A LOW-COST WELD TIMER

of the electronic type for accurate timing



The NEW EC&M NEOTRON Weld Timer . . . for Spot, Gun and similar Welders

Long recognized for accuracy in timing, electronic timers have been used on applications in which accurate results justified the higher cost. Now, the ***low-cost*** EC&M NEOTRON Weld Timer makes it possible to secure precision timing on any welder—on the small capacity welder as well as on larger ones.

This Timer provides a ***definite time*** for each weld and it is accurate over the entire range of adjustment. A direct-reading dial-plate makes the adjustment easily understood by any operator. NEOTRON Timers are available in 3 forms with time ranges of 1/2 to 60, 1 to 120 and 1 to 300 cycles. These values of time do not include the time constant for operating the magnetic contactor. Mail the coupon below for complete information. Fill it out and mail today.

THE ELECTRIC CONTROLLER & MFG. CO. CLEVELAND, OHIO

HEAVY DUTY MOTOR CONTROL FOR CRANES, MILL DRIVES AND MACHINERY • BRAKES • LIMIT STOPS • LIFTING MAGNETS AND AUTOMATIC WELD TIMERS.

THE ELECTRIC CONTROLLER & MFG. CO.
2688-A East 79th St., CLEVELAND, OHIO

Gentlemen:
Please send me folder 1201 describing the NEW EC&M NEOTRON WELD TIMER.

Name .....

Company .....

Address .....

vices required of distributing agencies. In lowering these costs, Mr. Doxsey said, progress can be made only through everlasting attention to every minute detail, eliminating wasteful operations when and as they are revealed and devising more effective methods at every opportunity. Consumers can assist in attaining better distributing methods and lower costs. . . ."

Steel warehousemen have difficulties in that their product can be sold only after a definite need has been previously created by conditions entirely beyond their control. Before the steel is needed, said the association's secretary, some other unrelated and separate organization had to create the demand. "Roughly speaking," Mr. Doxsey pointed out, "demand for steel usually was a few jumps ahead of production during the first two decades of the present century; and in the 10 years beginning with 1920, maximum production facilities were short of peak requirements when they rose from time to time.

Markets Decline

Since 1930, however, markets for steel have not advanced, but have rather fallen below former standards.

"Failing to keep pace with an increasing population, steel consumption during the past nine years represents an actual throwback of many years," Mr. Doxsey went on. And in spite of this, new uses for steel in that period have increased greatly. Because of this departure from the theoretical trend, steel warehouse distributers have lost about 2,460,000 gross tons annually, or the equivalent of 1938 total business.

"Not only have the distributer's problems been aggravated by continued lethargy in demand, but all the while competition has become keener. Information from all available sources clearly shows an expansion in the number of warehouse outlets in the last few years entirely out of proportion to market requirements. Furthermore, in years such as we have had since 1930 mill competition for warehouse size orders has been more intensive and has added substantially to the woes of the distributor."

Strength is exhibited, Mr. Doxsey believes, by the increase in percentage of total steel produced handled by the warehouse. For the five-year period, 1925 to 1929, the average was 11.3 per cent, while for the five years ended 1938, the average was 14.1 per cent, a gain of nearly 25 per cent. Solution of problems will be found only through a long-range plan, meticulously developed, and backed by the determination of all, distributer and producer alike, concluded Mr. Doxsey.

Courage on Prices

The importance of every steel warehouse distributer choosing his own prices by whatever method he likes, publishing them, and then sticking to them, was emphasized by Charles Dickerson, Miami-Dickerson Steel Co., Dayton, Ohio. Mr. Dickerson said low prices should not be a temptation to the industry, and that it should have the courage to reject such offers.

Mr. Dickerson then quoted an example of a scrap dealer giving prohibitive price competition on over-runs or reject material. "I think we are entitled to consideration and protection from the mills," he said. ". . . Some orderly method might be devised for disposition of over-runs and rejects on bar and flat stock that would not disturb the distributer's market."

For Production Cleaning of Aluminum . . . .

use PERM-A-CLOR

Sales appeal in your products is closely related to your Cleaning Methods. To get ***extra customer appeal*** use Detrex Solvent Cleaning on your production!

On your difficult jobs (such as aluminum, die castings, and mixtures of ferrous and non-ferrous metals) Perm-A-Clor solvent is ***the*** satisfactory material to use because of its higher stability and longer life.

For quick, sure, low-cost, and safe cleaning of all kinds of metal parts, for inspection, finishing, etc., Detrex Solvent Degreasing is your answer.

Write for information on either solvent degreasing or alkali cleaning. Would you like a demonstration or a survey? We will send an experienced engineer to consult with you—without obligation.

DETROIT REX PRODUCTS CO.

Metal Cleaning Engineers—Solvent Degreasing and Alkali Cleaning

13015 HILLVIEW AVENUE **DETROIT, MICHIGAN**

Branch Offices in Principal Cities

Government Steel Contracts $327,700

WASHINGTON—Government contracts for iron and steel products, as reported by the Public Contracts Division of the Labor Department for the week ended, April 8, amounted to $327,700. For the same period contracts totaling $343,674 for machinery purchases were reported. Details follow:

Iron and Steel Products

The Steel Improvement & Forge Co., Cleveland, steel forgings	$21,567.60
The Midvale Co., Nicetown, Philadelphia, steel forgings	226,325.00
Diebold Safe and Lock Co., Canton, Ohio, services to finish machine castings	14,944.00
Youngstown Sheet & Tube Co., reinforcing steel	11,512.49
Carnegie-Illinois Steel Corp., McKeesport, Pa., steel, sheet	19,327.95
Hart Mfg. Co., Louisville, stoves, heaters, ranges	20,723.50
Protectoseal Co., Chicago, steel safety cans	13,300.00

Machinery

Lloyd & Arms, Inc., Philadelphia, precision lathes	$10,239.00
Marshall & Huschart Machinery Co., Chicago, boring mill	24,240.00
The Hanson-Whitney Machine Co., Hartford, Conn., milling machines	19,717.94
Austin-Hastings Co., Inc., Cambridge, Mass., engine lathes	23,154.00
The Hendey Machine Co., Torrington, Conn., modifying and modernizing lathes	11,170.00
Worthington Pump & Machinery Co., Harrison, N. J., centrifugal pumps	143,878.50
Thomas Machine Mfg. Co., Pittsburgh, pump parts	33,544.00
Lidgerwood Mfg. Co., Elizabeth, N. J., steam winches	77,731.00
Milwaukee Electric Tool Corp., Milwaukee, electric drills, hammers	Indefinite
The New Home Sewing Machine Co., Rockford, Ill., sewing machines	Indefinite
Singer Sewing Machine Co., New York, sewing machines	Indefinite

Warehouse Association Chapters Elect Officers

CLEVELAND—The following chapters of the American Steel Warehouse Association have elected officers as follows for the coming year, W. S. Doxsey, executive secretary, announces:

Central States Chapter: President, Bud Lowenstine, Central Steel & Wire Co., Chicago; vice-presidents, W. J. Holliday, W. J. Holliday & Co., Hammond, Ind., and E. G. Fisher, National Steel Corp., Chicago; secretary, C. G. Bothwell, Edgar T. Ward's Sons Co., Chicago; treasurer, M. A. Blessing, Jones & Laughlin Steel Corp., Chicago. Mr. Lowenstine will also serve as national director.

Cincinnati Chapter: President, J. W. Herr, Cincinnati Steel Products Co.; first vice-president, Charles W. Brown, Brown Steel Co., Columbus; second vice-president, J. C. Wagner, Todd-Donigan Iron Co., Louisville, Ky.; secretary, G. E. Mayer, Jones & Laughlin Steel Corp.; treasurer, J. C. Betz, S.A.E. Steels; national director, J. A. Thiele, Miami-Dickerson Steel Co., Dayton.

Detroit Chapter: President, A. N. Koch, Steel Plate & Shape Corp.; secretary-treasurer, Geo. L. Morin, Central Steel & Wire Co. Mr. Morin also is national director.

Missouri Valley Chapter: President, E. F. Mayer, Kansas City Structural Steel Co., Kansas City, Kan.; vice-presidents, G. E. Heimovics, Milcor Steel Co., Kansas City, and Ivan H. Clough, Gate City Iron Works, Omaha; secretary-treasurer, R. W. Wilkinson, Paxton & Vierling Iron Works, Omaha; national director, E. F. Mayer.

Northern Ohio Chapter: President, E. J. Heffner, Scully Steel Products Co.; vice-president, F. W. Krebs, Super Steels, Inc.; secretary-treasurer, George Parker, Edgar T. Ward's Sons Co.; national director, F. A. Michell, S.A.E. Steels, all of Cleveland.

Pittsburgh Chapter: President, J. M. Hilbish, Jones & Laughlin Steel Corp.; vice-presidents, J. H. Fogwell, Scully Steel Products Co., and F. B. Lorenz, Edgar T. Ward's Sons Co.; secretary, D. Davis, Bethlehem Steel Co., Carnegie, Pa.; treasurer, William L. Abbott, McKee-Oliver, Inc.; national director, Mr. Fogwell.

Southern California Chapter: President, E. Jungquist, Percival Steel & Supply Co.; vice-presidents, John Robertson, A. M. Castle Co., and Donald Priest, Los Angeles Heavy Hardware Co.; secretary-treasurer, Lyle B. Yeaton; all of Los Angeles; national director, Mr. Robertson.

Wisconsin Chapter: President, George Gibbs, Gibbs Steel Co.; vice-president, L. R. Moise, Moise Steel Co.; secretary-treasurer, George W. Smith, Jos. T. Ryerson & Son, Inc.; all of Milwaukee. Mr. Moise will also serve as national director.

Now You Can Re-Circulate Very Hot Gases - - and Cut Costs

MICHIANA
High Temperature
FANS

● Fuel and operating costs can be reduced by means of re-circulation of hot gases or products of combustion. —with MICHIANA Fans.

Through over 20 years of experience in connection with processes where high temperatures are encountered,—MICHIANA is able to offer a fan of radically new design and construction, — the vital operating parts of which, made of MICHIANA Cast Heat-Resistant Alloys, require no screws, bolts, rivets or welds.

Free expansion and contraction is permitted, eliminating strains and distortions. The complete wheel, too, may be removed and replaced easily. MICHIANA High Temperature (800° to 1800° Fahr.) Fans will cut your costs. Let us mail you a copy of Bulletin 638A.

MICHIANA PRODUCTS CORPORATION
Michigan City, Indiana

. . . OBITUARY . . .

JACKSON DAVIS ALLEN, manager of sales, cold finished products, Jones & Laughlin Steel Corp., Pittsburgh, died at Pittsburgh on May 10, aged 52 years. Mr. Allen's entire business career had been with Jones & Laughlin. He started with it in 1903 in the order and shipping department, was transferred to the cold finished sales department in 1910 and was appointed manager of that department in 1930.

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GEORGE C. MILLER, president of the Dodge Mfg. Corp., Mishawaka, Ind., died suddenly last week, aged 61 years. Mr. Miller was an industrial engineer and had been general manager of Montgomery Ward & Co., Chicago, president of the Tillotson Mfg. Co., Pittsfield, Mass., and vice-president of George W. Goethals & Co., which dug the Panama Canal.

BENJAMIN G. FOLLANSBEE, a founder of Follansbee Brothers Co., Pittsburgh, died May 10, aged 88 years. He began his career with the Union Railroad lines and in 1894 joined with his brother in forming the Follansbee Brothers Co. He was president of the company until 1916 at which time he became chairman of the board. He retired from business in 1933.

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FRANK C. ROBBINS, who years ago operated the Niles Iron & Steel Roofing Co., and later became president of the Niles Car & Mfg. Co., Niles, Ohio, died May 6 in Cleveland. He was 80 years old.

J. D. ALLEN

ARTHUR W. MERKEL, vice-president of the Continental Gin Co., Birmingham, died May 6 after an illness of several months. He was a graduate of the Alabama Polytechnic Institute and had been with the Continental Gin Co. for 34 years.

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GRANT MONK, aged 48 years, rail mill superintendent at Gary works of Carnegie-Illinois Steel Corp., and an outstanding authority on railroad materials and their metallurgy, died suddenly of a heart attack last week while walking to the rail mill dock. Mr. Monk's study of metallurgy, in which subject he was entirely self-taught, began in 1912 when he was a clerk and materials supervisor in the Chicago office of the Santa Fe. Mr. Monk left the Santa Fe in 1920 to join the metallurgical staff of the old Illinois

Steel Co. in its Chicago offices. He remained there 16 years, leaving to become chief inspector at Gary works, which position he held until March 16 of this year, when he was promoted to the superintendency of the rail mill. Active in plant and civic affairs, Mr. Monk also belonged to the American Railroad Engineering Society, American Society for Testing Materials, and the American Society for Metals.

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H. E. McClumpha died after a long illness at his home in Bellevue, Pa., May 13. A former executive of Keystone Car Wheel Co. and its successor Southern Wheel Co., his invention of the continuous method of casting chilled iron wheels on movable platforms accurately timed for the heat-treatment cycle has become standard practice in the industry. Moreover in 1902 at Mount Vernon Car Mfg. Co. he was one of the first to set up a chemical laboratory for quality control in a carwheel foundry. At the time of his retirement in 1930 he was vice-president of Southern Wheel Co., now a unit of American Brake Shoe & Foundry Co.

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Hugh Jackson, superintendent of open hearths for Youngstown Sheet & Tube Co., died at his home in Youngstown, May 10, after a long illness. He was 62 years old.

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E. P. Aldredge, assistant general superintendent in charge of the tin works at the Farrell plant of Carnegie-Illinois Steel Corp., was killed in an automobile accident May 11. He was 55 years old.

❖ ❖ ❖

Adrian Boyd Sloan, secretary and treasurer of the Cushman Chuck Co., Hartford, Conn., died on April 30, aged 57 years.

Pittsburgh Steamship Operating 64 Vessels

THE Pittsburgh Steamship Co., subsidiary of the United States Steel Corp., began its season May 12 with 64 vessels in operations, representing 86 per cent of available single trip capacity. Last year the company started the season around May 16 with 40 vessels in commission or 60 per cent of available tonnage. The entire fleet, which is the largest on the Great Lakes, consists of 73 steamers and six barges.

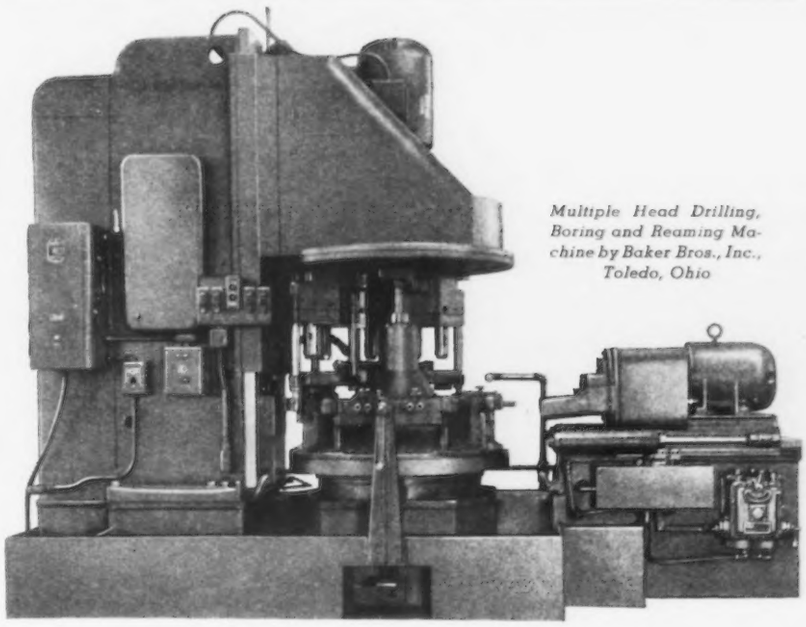
Link-Belt News Issues Souvenir Edition

CHICAGO — The May-June issue of Link-Belt News, which is being distributed at the New York World's Fair is a souvenir historical edition, especially prepared for that occasion by the Link-Belt Co., Chicago. The beginnings of the company in 1875 are traced and its progress throughout the years is discussed. Of particular interest are the photographs of the original founders of the company. In addition to the personnel section of the special edition, are many illustrations of Link-Belt products in actual use.

American Chemical Paint Holds International Rally

EXECUTIVES of the American Chemical Paint Co., Ambler, Pa., and executives of affiliated firms in 14 foreign countries, will meet May 28 to June 10 at Ambler.

LET OILGEAR FEEDS SOLVE THAT STUBBORN PROBLEM



Multiple Head Drilling, Boring and Reaming Machine by Baker Bros., Inc., Toledo, Ohio

The range of Oilgear Fluid Power Feed applications is so broad, the type of machine and machine tool problems they can solve is so varied, that we gladly extend an invitation to every designer with a stubborn power problem on his hands to counsel with our engineers.

Forget the usual limitations on power applications; forget the conventional do's and don'ts, see what Oilgear Fluid Power Feeds can offer you before you say it can't be done. If it's greater speed, better control, simpler design, stepped-up production, reduced tool breakage, or lower material and tool costs you're after, put it up to Oilgear. Even the tough jobs are often simple the Oilgear way. Write and see. THE OILGEAR COMPANY, 1311 West Bruce Street, Milwaukee, Wis.

OILGEAR

FLUID POWER FEEDS

. . . THE NEWS IN BRIEF . . .

Business finds savings in President's reorganization plans "mere pittances" against towering Government costs.—**Page 94.**

Germany now leading producer of aluminum.—**Page 96.**

Standards Bureau tests sheet steel flooring.—**Page 98.**

House Committee approves purchase by U. S. of Bethlehem Steel Co. shipyard.—**Page 99.**

Harry Hopkins' speech to "highlight" National Foreign Trade Week.—**Page 99.**

J. L. Perry, E. L. Ryerson are elected directors of American Iron and Steel Institute.—**Page 99.**

$1,454,700 order for Boulder Dam generators goes to Westinghouse.—**Page 100.**

Why TNEC held beryllium hearings puzzles Washington.—**Page 96.**

Italy finds tin ore deposits in East Africa.—**Page 100.**

Leiserson, new NLRB member, warns of chiseling against New Deal labor policies.—**Page 100.**

Accidents are "operating mistakes," Republic executive says.—**Page 101.**

Truscon Steel's wire mesh plant begins operation.—**Page 101.**

Invention—the foundation of new industries.—**Page 101.**

Trade associations are not price fixers, Steel Warehouse Association is told.—**Page 111.**

Government steel contracts for latest reported week, $327,700.—**Page 113.**

Link-Belt "News" issues souvenir edition.—**Page 115.**

Foreign company executives to attend American Chemical Paint Co. conference starting May 28.—**Page 115.**

Pittsburgh Steamship Co. starts season with 64 vessels operating.—**Page 115.**

New method of flame control said to increase uniformity of bessemer steel.—**Page 118.**

Elmira chapter, A.S.T.E., hears talk on vacuum tubes by R. H. Rogers.—**Page 118.**

SWOC loses Interlake Iron Corp. election, but files charges against company.—**Page 119.**

Deere & Co. will expand three Moline plants.—**Page 119.**

Westinghouse Division at Mansfield, Ohio, reports 53 per cent business gain.—**Page 119.**

SECTIONS INDEX

Obituary	114
Personals	104
Steel Ingot Production	123
Summary of the Week	124
Comparison of Prices	125
Pittsburgh, Chicago, Cleveland, Philadelphia and New York Markets	126
Scrap Market and Prices	130-131
Finished Iron & Steel	132-133
Pig Iron & Raw Material Prices	134
Warehouse Prices	135
Non-ferrous Market	137
Fabricated Steel	136
Machine Tool Activity	142
Plant Expansion & Equipment	138

MEETINGS

May 22 to June 8—Society of Automotive Engineers, world congress, in various cities.

May 24 and 25 — National Metal Trades Association, Chicago.

May 25—American Iron and Steel Institute, New York.

May 25 to June 1—Triple Convention (American Supply and Machinery Association, the National Supply and Machinery Distributers' Association and the Southern Supply and Machinery Distributers' Association), on board the S.S. Monarch of Bermuda.

June 5 and 6—Associated Machine Tool Dealers, Schenectady.

June 19 to 22 — American Electro-Platers' Society, Asbury Park, N. J.

June 26 to 30—American Society for Testing Materials, Atlantic City, N. J.

Oct. 23 to 27—National Metal Congress, Chicago.

Great Northern Railroad sees more iron ore shipped in 1939.—**Page 119.**

Stran-Steel building construction is tested at University of Detroit.—**Page 119.**

New Departure Co. observes 50th anniversary.—**Page 120.**

United States Steel Corp. finished steel shipments decline 66,451 tons in April.—**Page 120.**

CIO contract is renewed for year by International Harvester Co.—**Page 120.**

East St. Louis zinc plant is shut down due to low foreign price.—**Page 120.**

Microscope and alloys covered by A.F.A. books.—**Page 120.**

Blaw-Knox Co. to provide equipment for Dominion Steel & Coal Co.'s new open hearths.—**Page 121.**

NLRB issues complaint against Link-Belt Co. as 700 employees join non-CIO union.—**Page 121.**

Gray Iron Founders' Society elects C. J. Miller president.—**Page 121.**

British seek to stop making of tin plate in the Dominion.—**Page 121.**

Coal Mines owned by steel companies still idle.—**Page 121.**

International Harvester Co. sales off 17.3 per cent in first quarter.—**Page 121.**

Machine tool index drops 16 per cent in April.—**Page 142.**

National Machine Tool Builders' Association issues booklet, "Machine Tools And You."—**Page 142.**

Vlchek Tool Co., Cleveland, enters manufacture of plastics.—**Page 142.**

British cease the exporting of pig iron and scrap to Germany.

Welsh tin plate quota lifted twice and is now at 70 per cent.

Steelmakers will testify in move to broaden Public Contracts Act.

Question:

"MR. OWNER, SHOULD THE DOORS BE ELECTRICALLY OPERATED?"

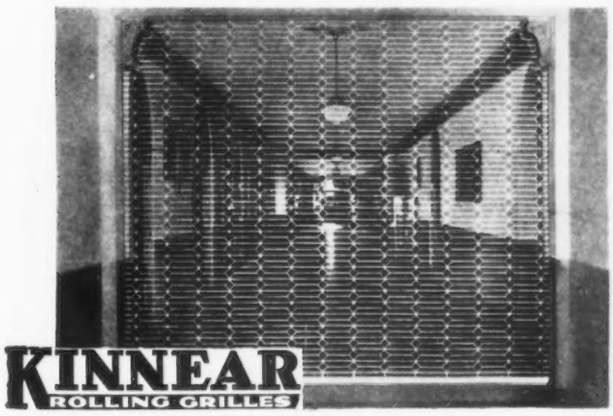
"BY ALL MEANS! INCREASING WAGES MAKE THE LABOR ECONOMY OF REMOTELY CONTROLLED DOORS ESSENTIAL."

That's the universal answer when Owners are questioned . . . particularly when they understand the advantages of Kinnear Motor Operated Doors. They want the convenience and time-economy of push-button control . . . of operating service doors from any number of strategically located remote stations. It eliminates wasted time, steps and efforts. It complies with the 1939 demand for increased mechanical efficiency.

KINNEAR
ROLLING DOORS

Kinnear Motor Operated Doors provide dependable, carefree remote door control . . . and more too! They give the advantages of the UPWARD ACTION that have made Kinnear Rolling Doors famous the world over. Spring counterbalanced and coiling above the lintel, they're out of the way, saving floor and wall space, unhampered in operation by ground obstructions, and less subject to damage. Built entirely of steel they are almost indestructible — fireproof — burglar-proof — weatherproof. They're built to last!

The power operator of a Kinnear Motor Operated Door embodies features that quickly identifies it as the leader in power equipment. Built to function as an integral part of a door of proved performance, here's a combination that insures permanent satisfaction and which is especially built to meet any condition. Let us work with you on your plans. Our nation-wide organization of Door Specialists puts us conveniently close at hand.



Protection
FOR INSIDE OR OUTSIDE USE

The Kinnear Rolling Grille solves many long-standing protection or intrusion problems. With window-shade convenience it provides a remarkably strong barrier of such an attractive design it can be installed in almost any type of opening. Spring counterbalanced, with mechanism encased in the wall, it operates easily and when raised is completely out of sight. It is built in any size and of various metals and for manual or electric operation. Ask for the A. I. A. Bulletin.

THE KINNEAR MANUFACTURING CO.

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New Method of Flame Control Improves Uniformity of Bessemer Steel

PITTSBURGH—After several years of painstaking research by its metallurgical department, the Jones & Laughlin Steel Corp. has instituted what it believes to be the first significant technical advance in bessemer steel making since the invention of the process.

The patents which the company has applied for cover several different methods, but procedure which is being used consists of an ingenious arrangement of photo-electric cells which provide an instantaneous record of the rapid changes in the bessemer flame. In conjunction with the cells and as a part of the control system, a complete instrument panel provides accurate regulation of blowing conditions.

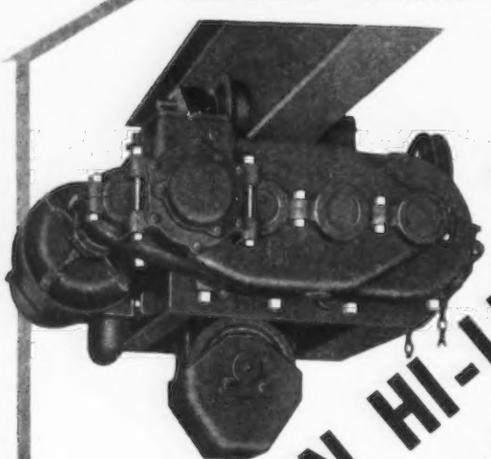
The new method, called the "bessemer flame control" has proven highly successful in achieving uniformity of quality in bessemer steel, according to the company which has conducted exhaustive tests of the new invention over a period of many months.

Until now, the company contends, control of the bessemer converter depended upon the skilled eyes of the blower who had sole responsibility in determining the proper "end point" or termination of the blow which has a definite relationship with quality results. The object of the research which resulted in this new method was to supplement the skill of the human eye with an invariable method that would not be affected by fatigue, inattention, poor physical condition, or other factors which affect the most skilled eyes at times.

It has been learned that the company's experiments resulting in the new method of controlling bessemer steel production, have been so successful that several additional studies involving fundamentals of bessemer steel making have been started by the company's pilot plant and laboratories, which will soon add a miniature bessemer converter to their equipment.

It is Jones & Laughlin's contention that their new method of aiding their blowers in flame control decisions by precision equipment will develop new applications for bessemer steels where uniform high quality steel is required. The company is also of the opinion that the "bessemer flame control" may influence the ultimate direction of steel making procedure.

You don't have to raise the roof . . .



New NORTHERN HI-LIFT HOIST Gives You MORE HEADROOM

Headroom costs plenty when you have to build it into the plant. Every inch of height eliminated makes substantial saving. • The New Northern Hi-Lift Hoist enables you to get along with less total headroom because it uses more that is already available. It lifts close to its supporting beam—allowing higher piling in storage space—easier handling of bulky loads everywhere. • It is stronger—has more lifting power. All mechanism is completely accessible. Mechanical brake parts may be removed without opening the gear case. • A variety of sizes and types—Northern is a long life, low cost Hoist.

NORTHERN ENGINEERING WORKS ***Detroit, Michigan***

CRANES *Northern* HOISTS

Elmira Tool Engineers Hear Talk On Vacuum Tubes

THE May meeting of Elmira Chapter No. 24, American Society of Tool Engineers, was held in Hotel Langwell, Elmira, N. Y., on May 12. A feature was a talk by Mr. R. H. Rogers, Industrial Division of the General Electric Co., Schenectady, N. Y., "Aids to Faster and Safer Machines." An explanation was given in non-technical language of how vacuum tubes and other devices perform the variety of duties put upon them in radio, television, electric welding, and in the control of machines and gaging devices used in the manufacture of products from steel, textiles, paper, cement and other materials. The June meeting will conclude the season's activities.

SWOC Loses Election But Files Charges

CHICAGO—The Interlake Iron Corp., Chicago, when poor business makes layoffs necessary, proceeds on the basis of efficiency and seniority. The SWOC, however, maintains that a single foreman, operating in secrecy, decides who shall be laid off, and who shall be retained.

The NLRB is now conducting a hearing in Chicago based on the charges of the steel union that Interlake discriminated in the discharge of 16 men. The union also claims that Interlake's employee association is company-dominated, in spite of the fact that in January, 1938, a Labor Board-sponsored election resulted in a 438 to 280-vote choice of the independent organization.

The charges result from two layoffs, in November, 1937, and in June of that same year. Although 494 persons were dismissed the CIO affiliate is confining its attentions solely to the 16 men named in the charge against the company.

Stran-Steel Tests Building Construction

DETROIT—Stran-Steel Division of the Great Lakes Steel Corp. is conducting two series of investigations on the strength of the Stran-Steel type of construction for dwellings at the University of Detroit, College of Engineering. One series of tests is being conducted by Prof. H. E. Mayrose, director of the Department of Engineering Mechanics. Similar investigations have been started recently by groups of university students for theses. Special loading frames have been constructed to permit investigation of strength for the development of new steel building products.

Deere & Co., to Expand Three Moline Plants

CHICAGO—Deere & Co. is making plans for a large expansion program at three of its plants in Moline, Ill. A five-story building, 94 x 150 ft. will be constructed to replace the present two-story structure which houses, the machine shop, tool room, and service and maintenance departments for John Deere plow works. A forge shop 80 x 260 ft. will be built at the spreader works and the forge shop at the wagon works will be replaced with a modern-type building 100 x 120 ft. Bids for the improvements will be asked soon.

Westinghouse Division Reports 53% Gain

CLEVELAND—A gain of 53 per cent in business for the first quarter of 1939 was reported for the Westinghouse Merchandising Division, Westinghouse Electric & Mfg. Co., Mansfield, Ohio, in a recent announcement by Frank B. Williams, Jr., vice-president in charge of the division. "Indications are that the upward trend will continue throughout the year," Mr. Williams said. "A slight recession may be noted for the summer months, but we believe total business for 1939 will be ahead of last year.

Great Northern Sees More Ore Shipped in '39

CHICAGO—At a recent meeting of the Great Northern Railroad directors, iron ore movements over the road for this year were estimated at nearly 11,500,000 tons, a substantial increase over 1938.

. . . and

Workers Who Sweat Need Salt

Doctors say: "Body salt must be restored when heat and sweat take it away."

Otherwise, Heat-Fag takes its toll—production sags and profits suffer.

Replace Body Salt with

MORTON'S SALT TABLETS

These little tablets represent the easiest and most convenient way to supply workers with the vitally needed salt that is sweated out by heavy work on hot days. In hundreds of the nation's leading plants, Morton's Salt Tablets are at every drinking fountain. A single push of the lever at the base of the modern sanitary Morton Dispenser supplies one tablet at a time.

MORTON'S SALT TABLETS Dissolve in 50 Seconds

They are easy to take—they dissolve quickly. Only the purest and most highly refined salt is used.

GUARD AGAINST HEAT-FAG AND THE HOT DAYS AHEAD

Place your order now for Morton's Dispensers and Morton's Salt Tablets. Remember — a small investment today will bring back big returns when Heat-Fag threatens your employes. Shipments will be made promptly — prepaid.

Write for folder —"Heat-Fag"

MORTON SALT COMPANY
CHICAGO, ILLINOIS

MONTHLY SHIPMENTS OF FINISHED STEEL PRODUCTS BY UNITED STATES STEEL CORP.—GROSS TONS

Month	1935 Shipments	1935 Per Cent of Capacity	1936 Shipments	1936 Per Cent of Capacity	1937 Shipments	1937 Per Cent of Capacity	1938 Shipments	1938 Per Cent of Capacity	1939 Shipments	1939 *Per-Cent of Capacity
January	534,055	31.9	721,414	44.8	1,149,918	75.4	518,322	33.7	789,305	51.8
February	583,137	39.2	676,315	45.3	1,133,724	82.5	474,723	35.5	677,994	49.3
March	668,056	41.5	783,552	50.5	1,414,399	92.7	572,199	37.2	767,910	50.4
April	591,728	36.7	979,907	63.2	1,343,644	91.0	501,972	33.7	701,459	47.5
May	598,915	35.8	984,097	63.4	1,304,039	85.5	465,081	30.2	.....	...
June	578,108	36.7	886,065	57.1	1,268,550	85.8	478,057	32.1	.....	...
July	547,794	34.0	950,851	61.3	1,186,752	77.9	441,570	28.8	.....	...
August	624,497	37.3	923,703	59.6	1,107,858	72.6	558,634	36.3	.....	...
September	614,933	39.7	961,803	62.0	1,047,962	71.1	577,666	37.5	.....	...
October	686,741	41.1	1,007,417	62.6	792,310	52.0	663,287	43.1	.....	...
November	681,820	42.3	882,643	59.2	587,241	39.7	679,653	45.6	.....	...
December	661,515	42.7	1,067,365	68.8	489,070	32.1	694,204	45.2	.....	...
Minus yearly adjustment	(—23,750)	...	(—40,859)	...	(—77,113)	...	(+30,381)	...	.....	
Total for year	7,347,549	38.1	10,784,273	58.2	12,748,354	70.4	6,655,749	36.7	.....	...

*Annual finished steel capacity 17,940,600 gross tons, with monthly percentages based on actual number of weeks in each month.

Steel Corp. Shipments Off 66,451 Tons in April

DESPITE allowances for the shorter month, shipments of finished steel products by subsidiary companies of United States Steel Corp. in April declined to 47.5 per cent of finishing capacity from 50.4 in the previous month. In April a year ago shipments were at 33.7 per cent. On a tonnage basis, April shipments were 701,459 tons against 767,910 tons in March and 501,972 tons in April, 1938. Total shipments for the current year through April are 2,936,668 tons, a gain of 42 per cent over the corresponding period of 1938.

Shipments of trackwork in April, reflecting the recent heavy buying by the railroads, gained 338 tons to 6819 tons, despite the shorter working period in the month, according to the American Iron and Steel Institute. In April a year ago shipments were 4150 tons. Thus far this year shipments are running 35 per cent ahead of the comparable period of 1938. For the four months through April, the total for the present year is 20,459 tons against 15,121 in 1938.

Zinc Plant Shutdown Due to Low Foreign Price

THE American Zinc, Lead & Smelting Co. is planning to discontinue all operation of retort furnaces at its East St. Louis, Ill., plant for an indefinite period. Approximately 325 workers will be affected.

Greatly increased operating costs which make it impossible to compete with the low price of metal coming into this country from Belgium and Mexico is said to be the cause for the move. The new duty on imported slab zinc, which became effective Jan. 1, reduced the protection received by domestic spelter by $7 a ton. A reduction in ocean freight rates recently increased this figure to $10 a ton.

British Cease Pig Iron and Scrap Exports to Germany

LONDON—Exports of pig iron and steel scrap from the United Kingdom to Germany, which were entered into some time ago when there was a surplus of these materials in the United Kingdom, have been completed and there is no present intention of resuming exports. This was announced in the House of Commons recently by Oliver Stanley, President of the Board of Trade.

President Stanley added that he would deprecate the export to any foreign country of materials of which there is any fear that Britain's domestic needs were not sufficient.

The scarcity of steel in Germany has to be met by increasing restrictions upon its use in building and other consuming industries. Suggestions were made some time ago that a good tonnage should be imported from Luxemburg, but so far this has not eventuated. The scarcity of steel materials in Germany has been increased by the difficulties of transport, due to the congested state of the railroads.

All German steel works are, of course, operating under conditions of great pressure, and much of the export business offered has had to be refused. This is especially the case where overseas buyers have requested early delivery. Foreign business placed with the German works recently has come largely from South America, but there has been a revival in the demand from India and the Far East.

New Departure Observes 50th Anniversary

THE New Departure division of General Motors Corp. this year is celebrating its 50th anniversary. At a recent dinner in Bristol, Conn., F. G. Hughes, general manager, traced the company's history and achievements.

CIO Contract Renewed by International Harvester

CHICAGO — The International Harvester Co. has renewed for one year the contract in effect last year with the United Farm Equipment Workers of America, a CIO affiliate. About 5000 employees of the tractor works here will be affected. The contract is subject to ratification by union members.

Microscope and Alloys Covered by A.F.A. Books

THE American Foundrymen's Association has published two new books, "Alloy Cast Iron," and "The Microscope in Elementary Cast Iron Metallurgy."

The 270-page discussion of alloy cast irons, a project of the gray iron division of the A.F.A., covers the effects of 18 different elements on the various properties of gray, white and chilled cast irons. The forms in which alloying elements are available commercially also are discussed as well as the different types that are added in various melting units. General foundry practice as applied to alloy cast irons is explained.

The second book, by Roy M. Allen, containing 160 pages, is an enlargement of a series of lectures to be presented at the 1939 convention of the A.F.A. in Cincinnati. In various chapters the author explains the behavior of different elements in cast iron and how they can be identified in the microstructure. Equilibrium diagrams are discussed, and in the final chapter information is given on focusing the microscope, taking photomicrographs, photography, and the preparation of samples. The book sells for $3 and is available from the American Foundrymen's Association, 222 West Adams Street, Chicago.

British Seek to Stop Making of Tin Plate in the Dominion

LONDON — The technical subcommittee of the Tinplate Joint Industrial Council was received in the House of Commons recently by Oliver Stanley, President of the Board of Trade, and Ernest Brown, Minister of Labor. The case for the employers was put by Sir William Firth, chairman of Richard Thomas and Co., and a statement was also made by Major J. M. Bevan, managing director of Briton Ferry Steel Co.

A memorandum was submitted, the details of which had the unanimoous support of both employers and employees in the industry. It emphasized that:

(1) The Government should do everything possible to prevent the development of the tinplate industry outside South Wales and Monmouthshire County, its traditional home.

(2) The Government should use its influence to prevent tinplate manufacture in the dominions, now an important market which is rapidly being lost.

(3) In view of increasing mechanization in the tinplate industry, estimated to have put out of work 75 per cent of the tinplate workers, the Government should give urgent attention to introducing approved new industries to the affected area.

At the same time it is said here that the Australian Government is expected to give its immediate sanction to the project advanced by the South Australian Cabinet and the Broken Hill Proprietary Co., for the establishment at Whyalla of a tinplate industry involving a capital expenditure of £2,500,000 (nearly $12,500,000), and the employment of 2000 men. The company is asking for protection for a long period against imports while guaranteeing no increase in prices in Australia.

Steel Company Mines Still Idle

PITTSBURGH — Unless the so-called "captive" mines, controlled and operated by steel producers begin operations within the next few weeks, it is expected that some steel companies will either have to purchase coal from commercial mines or face an acute shortage. Meanwhile, the first meeting between some "captive" mine owners and union officials was held Monday, May 15. Apparently only preliminary explorations took place since neither side had comment to make at the end of the meeting except to say that the conference would be reconvened Wednesday, May 17.

It is expected by some observers that the union will attempt to obtain the so-called "union shop" provision from the steel companies similar to what has been written into commercial mine contracts. Some sources believe that capitulation to this demand, should it be made, is out of the question on the basis that it would furnish a foothold to the CIO in a later attempt to gain a closed shop in the steel industry. On the other hand, it is recalled that the last union contracts signed between steel companies and the United Mine Workers provided for an open shop both in theory and in actual practice. Some official answer to these questions is anticipated within the next week or two.

Gray Iron Founders Elect C. J. Miller President

C. J. MILLER, president, Fremont Foundry Co., Fremont, Ohio, was elected president of the Gray Iron Founders' Society at the group's annual business meeting in Cincinnati on May 15. Other officers elected were: Vice-president, R. E. Kucher, Olympic Foundry Co., Seattle, Wash.; secretary, J. H. Pohlman, Pohlman Foundry Co., Inc., Buffalo, and treasurer, S. C. Mefford, Auburn Foundry, Inc., Auburn, Ind.

Directors elected at the meeting include C. R. Culling, Carondelet Foundry Co., St. Louis; A. L. Katelman, Katelman Foundry & Mfg. Co., Council Bluffs, Iowa; R. D. Phelps, Francis & Nygren Foundry Co., Chicago; P. E. Rentschler, Hamilton Foundry & Machine Co., Hamilton, Ohio; D. A. Cullinan, Western Foundry Co., Chicago; T. I. Curtin, Waltham Foundry Co., Waltham, Mass.; A. C. Denison, Fulton Foundry & Machine Co., Cleveland; W. J. Grede, Liberty Foundry, Inc., Wauwatosa, Wis.; Hugh Martin, Detroit Gray Iron Foundry Co., Detroit; W. F. Mosser, W. F. Mosser & Son, Allentown, Pa.; R. J. Redmond, Buckeye Foundry Co., Cincinnati; A. J. Rumely, Sr., LaPorte Foundry Co., LaPorte, Ind.; W. L. Seelbach, Forest City Foundries Co., Cleveland, and E. Spencer, Philbrick-Booth & Spencer Co., Hartford, Conn.

NLRB Issues Complaint Against Link-Belt

CHICAGO — The Link-Belt Co., Chicago, has been ordered by the NLRB to disestablish an alleged company union and to reinstate three employees said to have been discharged for union activities. The board claimed the company had aided a membership drive of the independent union and that 700 workers signed up in three days.

Pipe Plant to Be Built At Welland, Ont.

THE contract to build and install a complete Fretz Moon pipe plant at Page-Hershey Tubes, Ltd., Welland, Ontario, has recently been given to Salem Engineering Co., Welland, Ont., and Salem, Ohio.

This pipe plant will be capable of producing pipe up to and including 3-in. extra heavy. The furnace for heating skelp is to be fired with bunker C oil which is handled through an especially designed conditioning system included in the contract.

Blaw-Knox to Provide Dominion Furnace Equipment

PITTSBURGH — Blaw-Knox Co. has received an order for equipment to be used in the construction of two new open hearth furnaces at the plant of the Dominion Steel & Coal Corp., Sydney, Nova Scotia. The new furnaces will be built by Arthur G. McKee & Co., Cleveland engineering firm, and will be of the tilting type with rated capacity at 250 tons. The order to Blaw-Knox includes the reversing valves complete with operating mechanisms and all water-cooled doors and frames for all furnaces.

International Harvester Sales Off 17.3 Per Cent

CHICAGO — The International Harvester Co., in the quarter ended April 1, reported a decline in sales of 17.3 per cent compared with the same period a year ago.

REINFORCING STEEL

. . . Awards of 8800 tons; 5655 tons in new projects.

ATLANTIC STATES AWARDS

600 **Tons,** Bedford County, Pa., two bridges for Pennsylvania Turnpike Commission, to Bethlehem Steel Co., Bethlehem, Pa.

600 **Tons,** New York, Queens mid-town plaza, construction No. 14, to Bethlehem Steel Co., Bethlehem, Pa.

400 **Tons,** Pawtucket, R. I., water filtration plant, to Bethlehem Steel Co., Bethlehem, Pa.

375 **Tons,** Cumberland, R. I., water filtration plant, to Bethlehem Steel Co., through J. J. McHale, contractor.

270 **Tons,** New York, pier No. 26, construction 2144, to Bethlehem Steel Co., Bethlehem, Pa.

250 **Tons,** Everett, Mass., North metropolitan relief sewer, section 104A, to Northern Steel Co., through Edward M. Matz, Inc., contractor.

250 **Tons,** Northampton, Mass., high school, to Bethlehem Steel Co., through M. J. Walsh & Sons, Holyoke, Mass., contractors.

200 **Tons,** Philadelphia, apartment building, 26th Street and Parkway, to Bethlehem Steel Co., Bethlehem, Pa., through Turner Construction Co., contractor.

185 **Tons,** Clifton, N. J., bridge and culverts, to Bethlehem Steel Co., Bethlehem, Pa.

150 **Tons,** Meriden, Conn., sewage disposal plant, to Northern Steel Co., through Abertbaw Co., contractor.

100 **Tons,** Norwalk, Conn., Wilson Cove bridge, to Bethlehem Steel Co., Bethlehem, Pa., P. Mitchell, Inc., Greenwich, Conn., contractor.

100 **Tons,** Norwich, Conn., Shetucket River bridge, to Bethlehem Steel Co., Bethlehem, Pa., M. A. Gammino Sons Co., Providence, R. I., contractor.

CENTRAL AND WESTERN STATES

1800 **Tons,** Kansas City, Mo., food market, to Sheffield Steel Co., Kansas City, through Pette Construction Co., contractor.

650 **Tons,** St. Louis, post office garage, to Laclede Steel Co., through J. S. Alberici, general contractor, St. Louis.

300 **Tons,** White River, Ark., Newport levee, to Jones & Laughlin Steel Corp., Pittsburgh, through Arkansas Foundry Co., List & Clark, contractors.

270 **Tons,** Columbus, Ohio, Ohio State University men's dormitory, to Bethlehem Steel Co., Bethlehem, Pa., through Elford & Sons, Columbus.

265 **Tons,** Santa Ana, Cal., bridge, to Truscon Steel Co., Los Angeles, through Mittry Brothers Construction Co., Los Angeles, contractor.

260 **Tons,** East Cleveland, Ohio, WPA material for culvert, to Patterson-Leitch Co., Cleveland.

210 **Tons,** Clatsop County, Ore., Nehalem River bridge on Wolf Creek highway, to Mercer Steel Co., Portland, Ore., through Mountain States Construction Co., Eugene, Ore., contractor.

200 **Tons,** Detroit, factory and office building, Gelatin Products Co., to Bethlehem Steel Co., Bethlehem, Pa.

200 **Tons,** Pekin, Ill., sewage plant, Standard Brands, Inc., to Truscon Steel Co., Youngstown.

194 **Tons,** Pomona, Cal., two overcrossings, to Blue Diamond Corp., Los Angeles, through John Strona, Chino, Cal., contractor.

190 **Tons,** Everett, Wash., Snohomish River bridge approach, to Bethlehem Steel Co., Seattle, through A. D. Belanger, Seattle, contractor.

158 **Tons,** San Francisco, Bayer warehouse, to W. C. Hauck & Co., San Francisco, through Cahill Brothers, San Francisco, contractors.

151 **Tons,** Albany, Ore., overcrossing, to Mercer Steel Co., Portland, Ore., through Mountain States Construction Co., Eugene, Ore.

125 **Tons,** Midland, Mich., sewage treatment plant, to Pollack Steel Co., through Taylor & Gaskin Co., Detroit; Northeastern Construction Co., contractor.

112 **Tons,** Lake County, Ore., highway work in Willamette National Forest, to Soule Steel Co., Portland, Ore., through Kuckenberg Construction Co., Portland, contractor.

110 **Tons,** Chicago, 122nd Field Artillery, to Truscon Steel Co., Youngstown, through George Sollitt, contractor.

100 **Tons,** Davenport, Iowa, school, to Laclede Steel Co., through Langlois Construction Co., contractor.

PENDING REINFORCING BAR PROJECTS

ATLANTIC STATES

540 **Tons,** Springfield, Mass., sewerage treating plant, formerly reported as 450 tons.

500 **Tons,** Elmira, N. Y., state reformatory. Bids resubmitted June 1.

225 **Tons,** Pittsburgh river front boulevard, construction No. 3.

200 **Tons,** Belcamp, Md., shoe factory and employees' residences, Bata Shoe Factory.

172 **Tons,** Cecil County, Md., state roads commission, culvert and bridge construction.

150 **Tons,** Buffalo, Eagle Street sewer, bids open May 17.

100 **Tons,** Willington-Ashford-Union, Conn., State road, A. I. Savin Construction Co., Hartford, Conn., contractor.

100 **Tons,** Somerville, Mass., Hall Baking Co. garage.

CENTRAL AND WESTERN STATES

600 **Tons,** New Orleans, regional research laboratory for Department of Agriculture; bids May 23.

600 **Tons,** Peoria, Ill., research building, Department of Agriculture, bids in.

573 **Tons,** Chicago, Burr Oak Avenue bridge, Rock Island Railroad, bids in.

500 **Tons,** Alameda, Cal., Naval air barracks; bids June 1.

500 **Tons,** Albany, Cal., Federal regional agriculture laboratory; bids May 26.

445 **Tons,** Woodland, Wash., Lewis River bridge; bids May 23.

400 **Tons,** Greenville, Miss., superstructure for bridge across Mississippi River; bids May 16.

205 **Tons,** Natchez, Miss., superstructure for bridge across Mississippi River; bids May 19.

200 **Tons,** Kokomo, Ind., housing project; Superior Construction Co., Kokomo, general contractor, previously reported.

189 **Tons,** Urbana, Ill., Natural Resources building, University of Illinois; James McHugh & Son, Chicago, general contractors, previously reported.

170 **Tons,** Akron, Ohio, railroad State crossing elimination; bids May 26.

125 **Tons,** St. Louis, office and warehouse building, U. S. Engineer; Woermann Construction Co., St. Louis, low bidder on general contract, previously reported.

Unstated tonnage, San Francisco, Coast Guard air station; bids June 20.

Beryllium Corp. Enlarges Facilities

THE Beryllium Corp. of Pennsylvania has announced the completion of new, specially designed facilities for the commercial production of heat-treated beryllium alloys in rod, strip, and wire forms at its Reading, Pa., plant. Hitherto, the company has supplied master alloys only in the ingot and cast form. Now it will be possible to obtain 2 to 2.25 per cent beryllium - copper, beryllium - cobalt - copper, beryllium - chromium - copper, beryllium-nickel, and other alloys in the primary fabricated shapes.

It is now possible to fabricate rod, strip, and wire under exact laboratory control of all physical properties, it is claimed. From billet to finished strip, every operation is automatically checked and variations eliminated. Much more uniform hardening can be guaranteed and a wide range of beryllium-copper alloys can be supplied, some having electrical conductivities as high as 70 per cent that of copper.

Not sufficiently ductile and too costly for general use in its pure state, beryllium does, however, lend remarkable properties to copper and other nonferrous metals when alloyed with them. To naturally soft copper, it gives a hardness and resiliency that rates beryllium alloys high among spring metals. Fatigue life of the alloys is very high. Contact springs made of them have been vibrated ten billion times without failure. Another feature of beryllium-copper is that it won't spark when struck with other metals or even when ground on a stone wheel. This characteristic has resulted in its finding wide application in safety tools for use in the presence of explosive gases.

FINANCIAL NOTES

Net income of the Sloss-Sheffield Steel & Iron Co., Birmingham, for the first quarter, is reported at about $226,000.

Westinghouse Air Brake Co., Wilmerding, Pa., and subsidiaries, report for the first quarter of 1939 net earnings of $399,015.

Copperweld Steel Co., Pittsburgh, expects a successful year in 1939 as in 1938, according to S. E. Bramer, president. Stockholders last week voted an increase in authorized common stock, par value $5 a share, from 600,000 shares to 900,000 shares, and authorized creation of 50,000 shares of preferred stock, par value $50. The increase is to provide for future capital needs of the company.

Midland Steel Products Co. shareholders on April 27 reelected its officers and directors. Dividends of $2 per share were declared on the company's 8 per cent cumulative first preferred stock, 50 cents per share on the noncumulative dividend shares and 50 cents per share on the common stock, all payable July 1 to shareholders of record June 16. At the directors meeting, E. J. Kulas, president, reported a profit for the first quarter of 1939 after all charges, including estimated federal taxes, of $540,965.96.

Allis-Chalmers Mfg. Co., Milwaukee, earned $710,277 in the first quarter compared with $1,403,648 a year ago. Billings were down 13½ per cent. Unfilled orders totaled $12,367,518 at March 31 this year, compared with $10,411,411 three months earlier, and $20,248,025 a year ago.

Otis Steel Co. reports net profit for three months ending March 31, 1939, of $228,804.49, prior to Federal tax deduction and after allowing $276,000 for depreciation. For first quarter of 1938 the company reported net loss of $297,378.

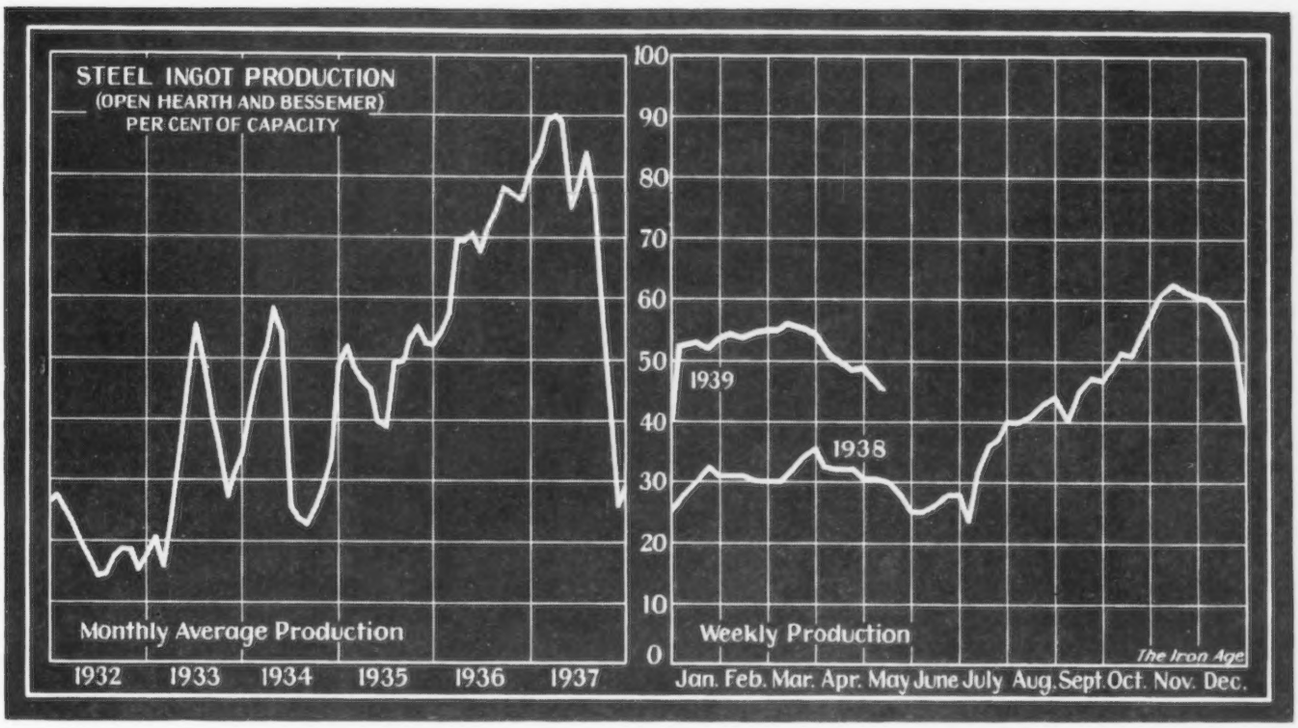
Colorado Fuel & Iron Corp. in the first quarter had net profit of $163,630 against a $389,561 net loss a year ago.

Granite City Steel Co. earned $13,435 as compared with a loss of $155,093 in the March quarter last year.

Pittsburgh Steel Co., Pittsburgh, reports net loss of $377,159 for the first quarter of 1939, compared with net loss of $277,230 in the corresponding 1938 period.

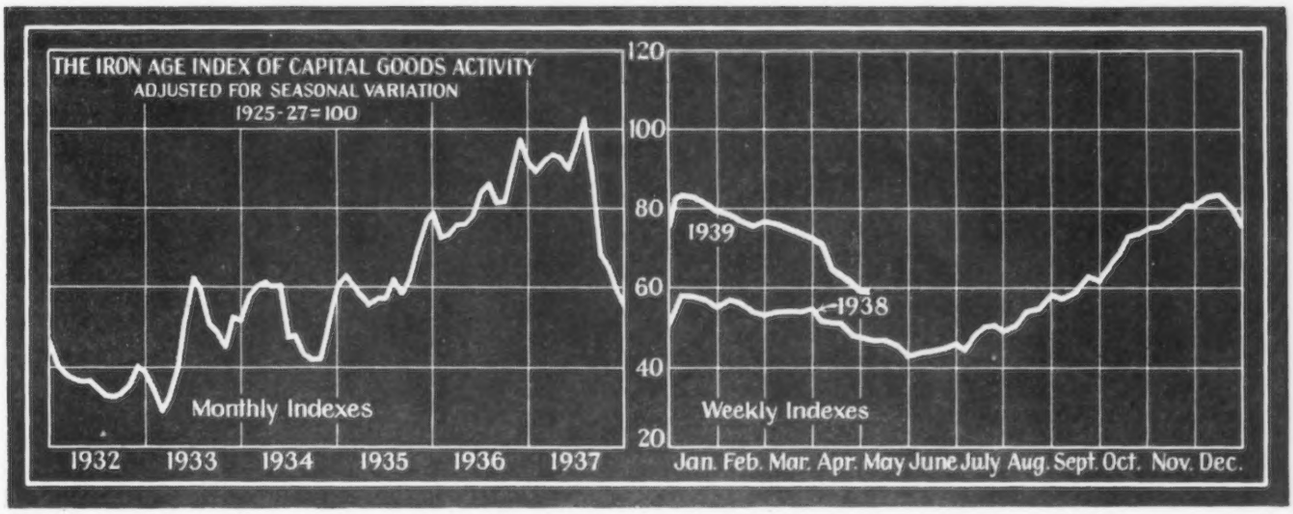
Consolidated net earnings of Continental Can Co., Inc., and its wholly owned subsidiaries, for the 12 months ended March 31, 1939, amounted to $7,158,840.

Ingot Production Drops One and a Half Points to 45½%



District Ingot Production, Per Cent of Capacity	Pittsburgh	Chicago	Valleys	Philadelphia	Cleveland	Buffalo	Wheeling	Detroit	Southern	S. Ohio River	Western	St. Louis	Eastern	Aggregate
CURRENT WEEK..	34.0	45.5	46.0	33.0	47.0	34.0	50.0	55.0	46.5	49.0	60.0	41.0	50.0	**45.5**
PREVIOUS WEEK..	36.0	46.0	46.0	33.0	42.0	34.0	59.0	55.0	46.5	49.0	60.0	53.0	50.0	**47.0**

Heavy Goods Output Shows Little Change in the Week



THE rate of operations in the capital goods industries showed little change in the past week, according to THE IRON AGE index, which ended the week at 59.1, down 0.1 point from the preceding week. Automobile production and lumber carloadings improved counter to the seasonal trend, resulting in small advances in both these indexes, while steel, construction and Pittsburgh series continued to move lower. The heavy construction averages, on a dollar basis, again moved higher in the past week, but this expansion has been consistently less than that required by the seasonal factors and consequently this index continues to move downward. With the reopening of the coal mines in the near future a possibility, there will probably be some accompanying improvement in the status of the combined index which at present stands at the lowest position since the week of Sept. 17, 1938.

	Week Ended May 13	Week Ended May 6	Comparable Week 1938	Comparable Week 1929
Steel ingot production[1]	59.9	62.2	38.3	128.5
Automobile production[2]	60.5	59.2	40.1	127.4
Construction contracts[3]	74.1	75.2	62.0	123.1
Forest products carloadings[4].	53.2	51.7	45.6	115.4
Production and shipments, Pittsburgh District[5]	47.8	47.9	45.9	124.3
Combined index	**59.1**	**59.2**	**46.4**	**123.7**

Sources: 1. THE IRON AGE; 2. Ward's Automotive Reports; 3. *Engineering News-Record;* 4. Association of American Railroads; 5. University of Pittsburgh.

. . . SUMMARY OF THE WEEK . . .

. . . Price chaos in sheets and strip brings out new quotations.

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. . . Cuts ranged from $4 to $8 a ton; quantity deductions withdrawn.

o o o

. . . Ingot production slightly lower; Pittsburgh scrap declines.

THE worst price chaos the steel industry has experienced in years, not excepting the sharp decline of last October, culminated in the withdrawal of low quotations on Saturday by all companies and the announcement on Sunday by the leading producer of reduced quotations on sheets, strip and hot rolled carbon and alloy steel bars, together with the discontinuance of quantity deductions, which have been a cause of much of the industry's recent price troubles.

Although the acute phases of the price confusion lasted only a few days, a fairly large tonnage of sheets and strip was booked at prices ranging from $4 to $8 a ton below those which were announced as effective for the second quarter. Opinion in the trade differs as to whether the aggregate was as large as that taken last October, which was sufficient to carry a good many consumers, particularly the automobile industry, through the first quarter of this year. In the Chicago district it is stated that bookings are larger than those of last October, and it is certain also that automobile companies have covered their requirements for some time ahead, certainly through the third quarter and possibly beyond that. In other directions the amount of coverage was limited by the fact that there are still considerable stocks in the hands of consumers and distributers that have been carried over from last fall's low-priced coverages, shipments against which have been made as recently as late April.

Early last week there were positive evidences of cuts of $4 a ton on sheets, but these were not then sufficiently widespread to warrant changes in official quotations. By Thursday the cuts had extended over a good deal of the country and by Friday they had grown to $6 and $8 a ton.

Price concessions were almost wholly confined to flat rolled products, but some weakness had also developed in bars. With the withdrawal of these concessions and the substitution of new quotations, this week's price for hot rolled sheets becomes 2c. a lb. as against a former official price of 2.15c., which, however, was subject to a $3 a ton discount for quantities of 75 tons or more of one size and grade. Thus the net base price for the larger users is the same as before. However, on hot rolled bars the reduction in the base price is only $2 a ton; thus, the actual net base to large buyers is $1 a ton higher than before. There has been some grumbling about these changes among large buyers, whose insistence on their right to a preferential price based on quantity purchases brought about the adoption of quantity deductions a few years ago.

Tin plate, which has recently been subject to quarterly price announcements, was not mentioned in this week's announcement, but it is understood that the present quotation of $5 per base box will be continued into the third quarter. Prices of other products were reaffirmed for the third quarter.

THE heavy bookings of sheets and strip, which may be augmented somewhat by bar bookings if the quantity discount on bars is continued to the end of the quarter, probably will tend to prevent a further decline in steel operations, which this week are down a point and a half to 45½ per cent. The coal situation has not entirely disappeared as an influence, however, because the "captive" mines, owned and operated by steel companies, have not yet signed with the United Mine Workers. If there is no agreement at meetings that are being held this week, steel companies may be forced to buy coal from independent mining companies. The steel companies are expected to resist the "union shop" provision that was written into the labor contracts signed by commercial mining companies, which might lead to a similar demand with respect to steel mill contracts. The "captive" mines are still closed.

Production of steel at Pittsburgh, at 34 per cent this week, is the lowest since August, excepting two holiday weeks last year, Labor Day and Christmas. The Wheeling-Weirton district rate, 50 per cent, has not been that low since June and July last year.

LOW production in that area has brought further weakness in steel scrap prices at Pittsburgh, which have declined 50c. a ton, bringing THE IRON AGE scrap composite down to $14.08, lowest since July, 1938. Near seaboard prices remain firm as a result of export buying. Orders placed by European countries in the past two weeks are estimated at 300,000 to 400,000 tons.

THE IRON AGE finished steel composite price for this week is 2.236c. a lb. Had it been figured on the basis of prices that were in effect last week, assuming an average reduction of $6 a ton on flat rolled products, it would have been 2.198c. compared with last October's low of 2.211c. The 1936 low, prior to wage increases, was 2.016c.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	May 16, 1939	May 9, 1939	Apr. 18, 1939	May 17, *1938
Rails, heavy, at mill	$40.00	$40.00	$40.00	$42.50
Light rails: Pittsburgh, Chicago, Birmingham	40.00	40.00	40.00	43.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Sheet bars: Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point	34.00	34.00	34.00	37.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham	40.00	40.00	40.00	43.00
Wire rods: Nos. 4 and 5, Pittsburgh, Chicago, Cleveland	43.00	43.00	43.00	47.00
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows Point, cents per lb.	1.90	1.90	1.90	2.10

Finished Steel

Cents Per Lb.:				
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.15	2.25	2.25	2.45
Plates: Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont	2.10	2.10	2.10	2.25
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham	2.10	2.10	2.10	2.25
Cold finished bars: Pittsburgh, Buffalo, Cleveland, Chicago, Gary	2.70	2.70	2.70	2.90
Alloy bars: Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton	2.70	2.80	2.80	3.00
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham	2.00	2.15	2.15	2.40
Cold rolled strip: Pittsburgh, Cleveland, Youngstown	2.80	2.95	2.95	3.20
Sheets, galv., No. 24: Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham	3.30	3.50	3.50	3.80
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown	2.00	2.15	2.15	
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown	3.05	3.20	3.20	...

Cents Per Lb.:	May 16, 1939	May 9, 1939	Apr. 18, 1939	May 17, *1938
Wire nails: Pittsburgh, Chicago, Cleveland, Birmingham	2.45	2.45	2.45	2.75
Plain wire: Pittsburgh, Chicago, Cleveland, Birmingham	2.60	2.60	2.60	2.90
Barbed wire, galv.: Pittsburgh, Chicago, Cleveland, Birmingham	†3.30	3.30	3.30	3.40
Tin plate, 100 lb. base box: Pittsburgh and Gary	$5.00	$5.00	$5.00	‡$5.35

*Pittsburgh prices only.
†Applies to 80-rod spools only.
‡Subject to post-season adjustment.

Pig Iron

Per Gross Ton:				
No. 2 fdy., Philadelphia	$22.84	$22.84	$22.84	$25.84
No. 2, Valley furnace	21.00	21.00	21.00	24.00
No. 2, Southern Cin'ti	21.06	21.06	21.06	23.89
No. 2, Birmingham	17.38	17.38	17.38	20.38
No. 2, foundry, Chicago†	21.00	21.00	21.00	24.00
Basic, del'd eastern Pa.	22.34	22.34	22.34	25.34
Basic, Valley furnace	20.50	20.50	20.50	23.50
Malleable, Chicago†	21.00	21.00	21.00	24.00
Malleable, Valley	21.00	21.00	21.00	24.00
L. S. charcoal, Chicago	28.34	28.34	28.34	30.34
Ferromanganese, seab'd carlots	80.00	80.00	80.00	102.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$14.25	$14.75	$15.00	$11.50
Heavy melting steel, Phila.	15.25	15.25	15.50	12.00
Heavy melting steel, Ch'go.	12.75	12.75	12.75	10.75
Carwheels, Chicago	12.50	12.50	12.50	12.50
Carwheels, Philadelphia	16.00	16.00	16.25	14.75
No. 1 cast, Pittsburgh	15.25	15.25	15.25	13.75
No. 1 cast, Philadelphia	16.25	16.25	16.75	14.25
No. 1 cast, Ch'go (net ton)	11.75	11.75	11.75	10.75

Coke, Connelsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.75	$3.75	$3.75	$4.00
Foundry coke, prompt	4.75	4.75	4.75	5.00

Non-Ferrous Metals

Cents per Lb. to Large Buyers:				
Copper, electrolytic, Conn.	10.00	10.00	10.50	10.00
Copper, lake, New York	10.00	10.00	10.75	10.125
Tin (Straits), New York	48.875	49.25	47.50	36.375
Zinc, East St. Louis	4.50	4.50	4.50	4.00
Zinc, New York	4.80	4.89	4.89	4.39
Lead, St. Louis	4.60	4.60	4.60	4.35
Lead, New York	4.75	4.75	4.75	4.50
Antimony (Asiatic), N. Y.	14.00	14.00	14.00	14.75

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
May 16, 1939	2.236c. a Lb	$20.61 a Gross Ton	$14.08 a Gross Ton
One week ago	2.286	20.61	14.25
One month ago	2.286	20.61	14.42
One year ago	2.512	23.25	11.42
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output	Based on average for basic iron at Valley furnace and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel HIGH	Finished Steel LOW	Pig Iron HIGH	Pig Iron LOW	Steel Scrap HIGH	Steel Scrap LOW
1939	2.286c., Jan. 3	2.236c., May 16	.....	.....	$15.29, Mar. 28	$14.08, May 16
1938	2.512c., May 17	2.211c., Oct. 18	$23.25, June 21	$19.61, July 6	15.00, Nov. 22	11.00, June 7
1937	2.512c., Mar. 9	2.249c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.92, Nov. 10
1936	2.249c., Dec. 28	2.016c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.062c., Oct. 1	2.056c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 29
1934	2.118c., Apr. 24	1.945c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.953c., Oct. 3	1.792c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.915c., Sept. 6	1.870c., Mar. 15	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.981c., Jan. 13	1.883c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.192c., Jan. 7	1.962c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.223c., Apr. 2	2.192c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.192c., Dec. 11	2.142c., July 10	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 9

. . . THIS WEEK'S MARKET NEWS . . .

PRICES

. . . Wave of price cutting followed by stabilization move

THE worst price chaos the steel industry has experienced in many years developed in the latter part of last week after it became known that concessions of $4 a ton had been granted by some mills and elsewhere on sheets and strip. Although the break in prices is supposed to have started in DETROIT, it is now well known that concessions had been given to buyers in other districts.

Up to the time THE IRON AGE went to press on Tuesday, May 9, it appeared, however, that the price cutting had not become sufficiently general to warrant actual changes in published quotations. By Thursday of last week the $4 a ton concession was being given to all of the more important buyers. In many instances mills were actively soliciting orders on this basis. It developed within 24 hours that $4 was not enough. Buyers who had placed orders on Thursday and Friday at $4 off threatened to cancel these orders if the concession was not increased to $6. In fact, quite a few orders were booked at $8 a ton off, and on top of this the $3 a ton deduction for quantity was also given.

On Saturday morning several steel companies withdrew all low quotations, agreeing to take only that tonnage for which there were outstanding commitments. In a good many instances district sales offices were given only a few hours in which to get in touch with all customers who had been quoted the low prices and withdraw these prices unless orders were immediately forthcoming. In the metropolitan centers, where many companies are now closed on Saturday, it was impossible for sellers to contact all buyers, with the result that these "mopping up" tactics were forced to go over until Monday.

Meanwhile, the Carnegie-Illinois Steel Corp. handed to the press on Sunday, a statement for release in Monday morning newspapers, an unusual procedure, as such statements in the past have been issued on a business day. This statement read as follows:

Carnegie-Illinois Steel Corp. announced today (May 15) reaffirmation of its present prices for shipment during the third quarter of 1939 for delivery and consumption in the United States. This announcement carries with it the statement that quantity deductions will be discontinued immediately and that because of the elimination of these deductions base prices on the products affected will be reduced $3 a ton on hot rolled sheets, cold rolled sheets and hot rolled strip, and $2 a ton on hot rolled carbon steel bars and hot rolled alloy steel bars. This will make these prices per 100 lb. as follows:

Hot rolled carbon steel bars
$2.175 base, delivered Pittsburgh
$2.18 base, delivered Chicago

Hot rolled alloy steel bars
$2.725 base, delivered Pittsburgh
$2.73 base, delivered Chicago

Hot rolled strip
$2.025 base, delivered Pittsburgh
$2.03 base, delivered Chicago

Hot rolled sheets
$2.025 base, delivered Pittsburgh
$2.03 base, delivered Chicago

Cold rolled sheets
$3.075 base, delivered Pittsburgh
$3.08 base, delivered Chicago

Editor's Note: The above prices include the switching charge. For outside delivery, these prices would not apply. For example, the base price on bars for outside delivery is 2.15c. a lb., Pittsburgh, and the same at Chicago, the switching charge being 50c. a ton in the Pittsburgh district and 60c. in the Chicago district.

On Tuesday, May 16, the American Steel & Wire Co. made the following announcement:

The American Steel & Wire Co. reaffirms the current base prices on hot rolled rods and wire for the third quarter of 1939.

They also announced the elimination of quantity deductions on low carbon cold rolled strip steel and commodity strip. Because of the elimination of these quantity deductions on strip, the base prices of these products are reduced $3 per ton, making them as follows:

Cold rolled strip (0.50 carbon and under)
$2.80 per 100 lb.

Commodity strip
$2.95 per 100 lb. f.o.b. Cleveland, plus switching charges.

In line with recent practice, other steel companies have made no formal announcement, but most of them have informed their customers that they will "meet competition."

The most significant feature of the Carnegie-Illinois announcement was the elimination of quantity deductions on sheets, strip and bars. These deductions, which were recently revised, have been the cause of many of the concessions, particularly on sheets. Even prior to last week's acute price break a good many steel companies had been virtually ignoring the quantity deduction set-up, and deductions of $3 a ton had been granted on quantities as small as a single carload. Moreover, the qualification that deductions would be given for stipulated quantities of one size and grade for shipment to one destination at one time was being almost totally ignored. The quantity deduction plan was an outgrowth of the insistence of large consumers that they were entitled to the benefit of better prices than small consumers. However, the plan hasn't worked and now it has been discarded.

Because of the elimination of the quantity deductions, the net base price to large consumers is actually unchanged on sheets and strip and is $1 a ton higher on bars as compared with the prices that were announced as effective for the second quarter. For example, the base price of hot rolled sheets, as published, was 2.15c. a lb. at principal basing points, but with the $3 a ton deduction for quantity this became a net base price of 2c. to the large buyer. The new price is 2c. without quantity deduction. On hot rolled bars, the base price was 2.25c., but with the $3 quantity deduction became 2.10c., while the new price is 2.15c. without deduction, or $1 a ton higher on larger lots.

Weakness in bar prices had not become pronounced, and, in fact, the change announced by Carnegie-Illinois came as a surprise to some of the independent companies.

The fact that last week's break in prices in its acute phases was over within a few days and was followed so quickly by a new announcement of price policy by the leading producer raises an unusual question in trade paper reporting of market prices. As of March 9, the date of publication of the March 11 issue of THE IRON AGE, it did not appear that outright changes in quoted prices were warranted by the scattered concessions that had become known. Between that time and the hour of going to press on this issue concessions ranging up to $8 a ton had been given. In view of the fact that these concessions have now been withdrawn and apparently no longer represent the market situation, they are not reflected in our price quotations this week nor in THE IRON AGE finished steel composite price. It is of interest, however, that this composite price, had it been figured at the end of last week, taking into ac-

count average reductions of $6 a ton, would have been 2.198c. a lb. as compared with last October's low of 2.211c. On the basis of this week's quotations the composite figure is 2.236c., which is a net decline of $1 a ton from last week's average.

No mention was made of galvanized sheets in the Carnegie-Illinois announcement. Meanwhile, price cutting in this commodity had apparently not ended as quickly as in other sheet mill products. Early this week galvanized sheets were to be had in some localities at 3.30c. or even less. In the East jobbers had been quoted 3.10c., including a $2 a ton jobbers' allowance.

NEW BUSINESS

. . . Sheet and strip bookings fairly heavy but other products lag

ASIDE from sheet and strip specifications, the magnitude of which will not come out until later, orders for other steel products last week hardly held their own with the previous week's level at Pittsburgh. No change in the current demand is expected for products other than flat rolled, and total bookings so far this month are running from two to 10 per cent below the corresponding period in April. Statistically, however, the aggregate volume of steel orders this month is expected to increase perceptibly when formal details are ironed out on last week's flat rolled business.

Sheet and strip buyers in the CHICAGO territory have covered into the third and fourth quarters. Incoming tonnage for the remainder of this quarter, and through July is likely to be very light. June 30 is the most common deadline heard for shipments of low priced tonnage in the CHICAGO district, but in at least one case specifications do not have to be in until June 12, which practically assures shipments through July and perhaps longer.

Selling last week around CHICAGO at the low levels was general and as many customers as possible were given the opportunity of covering on some of their future needs. Whether mills will revert back to last week's bargains for individual consumers at this late date depends entirely on the tonnage and customer involved. It is said in CHICAGO that more tonnage was booked at the low prices last week in that district than during the similar period last fall. Bookings of other products, including bars, were unaffected by the greatly increased activity in flat rolled. The CHICAGO situation, as concerns new business over the next few weeks in products other than flat rolled, is unchanged. Construction offers much potentially but not a great deal is being realized. Little difference in the condition of the agricultural machinery industry is reported. Field implement stocks are still good and tractor production, farm and industrial, continues high.

Order books of CLEVELAND and YOUNGSTOWN producers are considerably heavier, not only due to the recent coverage by consumers of sheet and strip steel, but also to slightly improved tonnage for merchant bars, plates and tin plate. Incoming sheet and strip orders will be quiet for some time ahead, but in the meantime mills will be busy attempting to clear recently placed tonnage as soon as possible.

A significant sidelight of the recent flurry to cover on steel is that apparently some of the new model automobiles may be out earlier than anticipated. Certain car manufacturers are believed well situated for the switch to 1940 production upon short notice and if the "go ahead" came soon, new models could appear in late July or early August. Parts makers have been notified to taper production on parts which will be obsolete, and not to go beyond late June in this respect.

PIG IRON

. . . Business dull . . . Prices unaffected by weakness in steel

PIG iron producers for the merchant market sat on the sidelines last week and watched the reports of sharp weakness in price of some steel products, but held firmly to their own quotations. However, the demand for pig iron has been too small to bring about any sharp competition for orders.

Although pig iron producers have continued to feel the pinch of coal and coke shortage during the past week, no further curtailment of operations has been reported, and it is probable, in fact, that some of the steel company furnaces that have been banked may resume blast shortly to provide metal for increased rollings of sheets and strip.

One of the largest pig iron orders in some time, amounting to 2500 tons, was placed last week by a machinery manufacturer in the East.

Shipments of iron, which were speeded up slightly during the coal crisis, have subsided somewhat now that fear of a coke shortage has passed. In the first 11 days of May shipments of foundry coke by producers in the CHICAGO area were 63 per cent ahead of those for the corresponding period of April, but meanwhile pig iron shipments in that district are just about equal to those of the same period last month. Upward of 5000 tons of pig iron for export has been booked in the past week. This tonnage, small though it is, represents a considerable increase in export activity. Department of Commerce figures for March, the latest available, showed only 1059 tons exported in that month.

PLATES

. . . Price concessions have become more common in the East

ALTHOUGH current prices for plates have been reaffirmed for the third quarter by the Carnegie-Illinois Steel Corp., competition among EASTERN plate mills has for some weeks been gradually undermining the price structure in that section. In its quotations this week THE IRON AGE recognizes concessions that have been made by quoting a spread of 2.19c. to 2.29c., delivered NEW YORK. Concessions have sometimes been in the base price and sometimes in the waiving of extras for sketch, quantity, etc.

Plate volume is very low, which is partly the result of the shutting down of car repair operations by some of the railroads. It is expected that the settlement of the coal strike may result in the reopening of some railroad shops, with larger releases of plates for repair work.

Demand for plates for car repairs in the CHICAGO area has slackened considerably in recent weeks. Most of the tonnage for the Denver & Rio Grande Western cars to be built by Pressed Steel Car Co. will be placed in the EAST. A possibility exists that the Milwaukee may place steel orders this week for 1000 cars the road may construct in its own shops. The Illinois Central inquiry for 1000 coal cars was withdrawn some time ago and

unless prices are obtained from car builders, it is understood that some of these units may be built in the road's own shops. Eight hundred Northwestern cars are awaiting court approval. Current demand around CHICAGO is heaviest from structural fabricators.

Tonnage entered on books at CLEVELAND so far this month shows a sharp gain over the comparable April period. This is due principally to marine construction orders, both for inland waterways and ocean going craft.

The Bureau of Supplies and Accounts, Navy Department, will open bids on June 1 for 900 tons of plates, sheets, strips and bars for the battleship *Alabama*, building at the Norfolk, Va., navy yard.

The bureau also will will open bids on June 6 for 360 tons of steel plates for delivery to the Pearl Harbor, Hawaii, navy yard and on May 26 it will receive bids for 188 tons of high tensile plates for delivery to the Washington navy yard.

WAREHOUSE BUSINESS

. . . Jobbers have made no price readjustments yet

NO price action has yet been taken by warehouses despite changes of base prices on certain products by mills. In general, the larger jobbers are not enthusiastic about the mill action on base prices and quantity deductions, inasmuch as it forces revaluation of stocks at some later date and also eliminates advantages previously enjoyed by large quantity purchasers. Smaller jobbers on the other hand will be in a relatively improved position by the elimination of quantity deductions.

BOLTS, NUTS AND RIVETS

. . . Incoming orders improve as automotive buying starts

OWING to activity of the automotive industry, incoming orders are improved in comparison to the first half of April, some manufacturers reporting gains of around 20 per cent. The jobbing trade reports a better movement also, but so far this has not been reflected in stock replacement orders. Principal automotive manufacturers are placing contracts for the start of the 1940 models. Bolt and nut prices to jobbers are stabilized at low levels.

STRUCTURAL STEEL

. . . Prices of plain material reaffirmed for third quarter

THE Carnegie-Illinois Steel Corp. has reaffirmed prices of plain structural material for the third quarter. In fabricated structural steel the price situation in nearly all sections of the country continues to be highly competitive.

Inquiries and awards are light this week. Outstanding awards include 1800 tons for a Navy yard shop at Boston, which went to the Belmont Iron Works; 1000 tons for the Ducommun metals plant in Los Angeles, awarded to Consolidated Steel Corp.

The Rock Island Railroad has taken bids on a bridge at CHICAGO requiring 2215 tons. A bridge over the Lewis River at Woodland, Wash., will take 1500 tons. The Bureau of Reclamation is asking for bids on 1500 tons of fabricated material for Grand Coulee Dam work.

Specifications for plain material have leveled off at PITTSBURGH for the first time in several weeks. This condition is not considered significant, however, in view of the substantial tonnages involved in recent awards. Inquiries reveal a better volume of privately financed work.

REINFORCING BARS

. . . Sheffield takes 1800 Kansas City award

AWARDS and new projects declined sharply the past week, the major contract of 1800 tons of material for a Kansas City food market going to Sheffield Steel Co. Six hundred tons for two Bedford County, Pa., bridges and a like tonnage for the Queens midtown plaza, New York, will be furnished by Bethlehem Steel Co. The State reformatory at Elmira, N. Y., which is being rebid June 1, will take 500 tons of reinforcing bars.

Prospects for greater activity in the CHICAGO area are more promising. No large awards are reported on the WEST COAST but a total of 1500 tons will be required by the Naval air barracks, Alameda, Cal., Federal regional agriculture laboratory, Alameda, and the Lewis River Bridge, Woodland, Wash. ST. LOUIS reports an award of 650 tons for the post office garage going to Laclede Steel Co.

RAILROAD BUYING

. . . Little new business has developed in past week

VERY little new business in railroad equipment has developed during the past week.

The Milwaukee road may buy steel this week for 1000 cars it plans to build in its own shops. The Illinois Central, dissatisfied with car builders' bids on its inquiry for 1000 coal cars, may end up building some of these in its own shops. Court approval is expected soon for the Northwestern's proposed 800 cars.

The Union Railroad has ordered 10 caboose cars from the Greenville Steel Car Co. The General Chemical Co. is expected to buy either five or 10 hopper cars.

The Pittsburgh & Lake Erie will buy 5000 tons of rails.

TUBULAR GOODS

. . . A slight gain seen in oil country orders

FOR the first time in several weeks, PITTSBURGH pipe makers have noted a slight gain in oil country goods specifications. Although the improvement has assumed no major importance and may not presage a general upward trend, the activity so far this month in oil-country goods business compares more favorably with March business than with the lower level during the early part of April.

SEMI-FINISHED STEEL

. . . Heavier sheet bookings may bring more orders

CURRENT prices have been reaffirmed for third quarter delivery by the leading interest. Still supported somewhat by tin bar tonnage from non-integrated tin plate mills, semi-finished steel bookings at PITTSBURGH are about equal to those of the same period last month. New business in the past week at PITTSBURGH has been a shade above the tonnage booked in the previous weeks. There is a good possibility that the flurry in flat rolled orders last week when concessions were prevalent may result in heavier semi-finished demand in the near future.

At CLEVELAND semi-finished sales to

date are below those of the first half of April. Demand for skelp, forging and rerolling billets and rods remains slack. Non-integrated sheet mills have been ordering slightly more heavily, however.

SHEETS AND STRIP

. . . "Bargain" selling of flat rolled products adds up to large tonnage

WHETHER volume of business in sheets and strip booked by the mills last week was equal to that done during the similar "bargain days" last October is subject to varying interpretations. In CHICAGO, for example, it is stated that more business was booked than at last fall's low prices, while in some other districts it is said to be less. One factor which held down the size of orders placed by individual consumers and jobbers is the one of inventory, as a good many buyers still have fairly substantial stocks carried over from last year's coverage, on which shipments have been made by some mills as recently as late April.

At the time of last October's buying flurry, it was stated by some of the sales departments of steel companies that the amount of tonnage booked in the aggregate had been greatly exaggerated in trade paper reports. Subsequent developments, however, indicated that instead of over-statement there had been under-statement. It has since developed that the principal automobile companies covered for practically all of their requirements for 1939 models, and the question now arises as to whether they have done likewise with respect to 1940 models, which will soon be in production. Various reports from the trade indicate that automobile companies and some other large consumers have bought sufficient flat rolled steel to cover their requirements at least through the third quarter, possibly to the end of the calendar year.

Some steel companies insisted upon the receipt of specifications with all orders taken at low prices, but it was soon apparent that this was not a general practice, and, in order to meet competition, all companies probably will be accepting specifications for some weeks to come. In many instances, the time being so short, only oral orders were given, to be followed by written confirmation.

MERCHANT BARS

. . . Base price reduced $2 a ton, quantity deductions eliminated

EFFECTIVE May 15, Carnegie-Illinois Steel Corp. eliminated quantity deductions on hot rolled carbon and alloy bars but at the same time partly compensated for the change by reducing the base price on these products $2 a ton. Although this move, which has been met by other producers, means a $2 reduction to many of the smaller customers whose buying habits did not involve enough tonnage to warrant the quantity discount, large bar buyers will in reality face a $1 a ton advance if their orders were sufficiently large to merit the $3 quantity deduction. It is expected, however, that large bar buyers will be able to specify for second quarter delivery, at least, under the terms in effect before the latest announcement was made. Hence there is a good chance that some forward buying may materialize in the bar market within the next week or so.

Some bars for 1940 models are being placed in CHICAGO, but the best customers in recent months have been the farm equipment and tractor makers. Some criticism has been heard this week of the $2 a ton reduction in the base price of bars announced on Monday by the Carnegie-Illinois Steel Corp. from large buyers who, under the quantity deduction setup, could obtain a discount of $3 a ton, while the present price is in effect an advance of $1 a ton for these companies when they buy in large tonnages.

Incoming orders to date at CLEVELAND are sharply ahead of the corresponding part of last month. Requirements of a tractor manufacturer have greatly assisted bookings.

No announcement has yet been made on cold-finished bars, and all bookings are being held up until the situation is clarified.

WIRE PRODUCTS

. . . Prices are reaffirmed for the third quarter

CURRENT base prices on rods and wire have been reaffirmed for third quarter of 1939.

Wire bookings at PITTSBURGH so far this month compare favorably with the volume in the corresponding April period. Order books, however, are becoming quite lean and incoming business is still below conservative expectations. Manufacturers' wire demand is expected to gain some support when automotive companies place business for initial 1940 model production.

Orders for manufacturers' wire became heavier last week at CLEVELAND but otherwise wire bookings, production and shipments showed very little change from the previous week.

Cable for the high line to be used in placing concrete for Shasta Dam, Central Valley project, Cal., will comprise a substantial tonnage.

TIN PLATE

. . . Operations hold at 70% . . . Heavier releases expected

TIN plate operations this week estimated at 70 per cent, unchanged from a week ago. The rate of incoming business has not changed much in the past week or two but heavier releases are expected in the near future.

Carnegie-Illinois Steel Corp.'s reaffirmation of steel prices for third quarter delivery, announced on May 15, is interpreted as meaning third quarter prices on tin plate will be unchanged from current quotations.

Weekly Bookings of Construction Steel

	Week Ended				Year to Date	
	May 16, 1939	May 9, 1939	Apr. 18, 1938	May 17, 1938	1939	1938
Fabricated structural steel awards	10,350	28,650	29,100	4,500	389,610	259,975
Fabricated plate awards	880	310	0	1,460	68,375	51,670
Steel sheet piling awards	665	2,775	0	0	22,005	8,750
Reinforcing bar awards	8,800	10,350	8,675	5,730	189,395	88,085
Total Letting of Construction Steel	20,695	42,085	37,775	11,690	669,385	408,480

IRON AND STEEL SCRAP

. . . Decline of 50c. at Pittsburgh forces composite down 17c. to $14.08 . . . Markets listless, with mill buying at low ebb.

MAY 16—Most markets are almost at a complete standstill and hence prices are largely unchanged and nominal in the absence of test. Little buying is expected within the next few weeks despite the possible upturn in operations following recent sheet and strip bookings obtained as a result of temporary price concessions. Based on small sales into consumption at Pittsburgh and broker-dealer transactions, almost the entire Pittsburgh list has been marked down 50c. a ton. Specialties at Chicago are weaker, but No. 1 steel remains unchanged in price. Largely owing to continued export support, No. 1 steel is also unchanged at Philadelphia, although sale of No. 2 steel to a domestic consumer has warranted a drop of 50c. in the quoted price of this grade. As a result, No. 1 steel is commanding $1 a ton more at Philadelphia than at Pittsburgh, a condition that has not prevailed in almost a year. THE IRON AGE composite price is down 17c. to $14.08, thus breaking through the low point of $14.17 of Oct. 25, 1938, and equaling the average prevailing on July 26. However, the average is still far from the low point of 1938 of $11, recorded on June 14.

The only strong spot in the whole picture is the export situation. Prices are firm at the principal Atlantic ports and should continue to hold this position in view of the huge backlog of orders now on hand. Revised estimates of European business of the past two weeks range all the way up to 400,000 tons.

Pittsburgh

With most consumers appearing indifferent and with sales into consumption involving very small amounts, the market this week shows further signs of weakness. Some interests are out of the market, while brokers are paying from $14 to $14.50 for No. 1 heavy melting steel. Likewise, small sales into consumption have been made between $14 and $14.50 for No. 1. Basing the market for this grade on current transactions, No. 1 heavy melting steel is quoted this week at $14 to $14.50, down 50c. a ton from last week's level. Items on the entire list have been marked down at least 50c. a ton.

Chicago

A few sales in specialties last week resulted in markdowns ranging from 25c. to $1 a ton. Heavy melting steel remains at $12.50 to $13 delivered, with brokers paying from $12.50 to $12.75 for this material. Some in the trade here feel that the present prices mark the low for the current period.

Philadelphia

The export market here continues its active pace of the past several months. One boat cleared Port Richmond on Sunday, one boat is finishing now and another boat has just docked. The next boat is expected about May 20. Of the first three boats, two cleared for Japan and one for Italy. Prices offered at Port Richmond show little change, that is No. 1 continues to bring around $15, and No. 2 about $13.50. With the large additional tonnage recently sold abroad, the market here will likely show no significant weakness over the next few weeks irrespective of what happens in the domestic market. Eastern Pennsylvania steel making operations continue to hold steady at 33 per cent, but this rate is not high enough to encourage scrap buying. A little No. 2 has been placed at near $12.75, delivered, and heavy cast and stove plate are 50c. lower on the basis of recent sales. Otherwise the domestic market is listless and will likely remain so for some months.

Cleveland

The local market remains at a standstill and the balance of this month appears likely to be quiet. Except for the Valley, which is taking a few cars a week from here, activity is hard to find even in dealer-to-dealer transactions. All prices are purely nominal and may be a little on the low side when finally tested.

Youngstown

The movement of scrap to mills against old orders continues desultory. One buyer early this week indicated that shipments may be curbed even more drastically. While mill operations are likely to pick up a little, due to the buying during the past week, very little effect is expected upon the scrap market. Some operating executives indicate that rather than think of buying they would be glad to be able to take in all the scrap now on order. Quoted prices are purely nominal and if tested might be found a little on the low side.

Buffalo

With steel production in the district still down no sizable sales have been reported this week. Sales of borings and turnings have advanced the prices of those commodities to $7.50 to $8. Spirit is good and dealers look to an encouraging future.

St. Louis

The scrap iron market is quiet. A district mill shows no dispostion to close a deal to purchase a considerable tonnage of heavy melting steel which has been pending for several weeks, and no other sales are in prospect. Prices are unchanged. The Southern Railway has a list of 4000 tons.

Cincinnati

The old materials market is quiet and featureless. Withdrawal of one railroad list during the past week indicates that bids are about as low as they can go. Mills on regular contract are specifying in smaller quantities. Only activity among dealers is for contract or to retain supply sources.

Detroit

Continued absence of activity and continued pessimism have been offset slightly in Detroit by the fact that scrap output from automobile plants and parts suppliers is dropping sharply. Tonnages apparently are at the lowest figure for the year, thus removing some of the burden from the market. Foundry activity continues at a good pace as duplicate dies are poured for 1940 models. Resumption of a higher level of scrap output by at least one plant about June 15 has been predicted.

Boston

What activity there is centers in the export market, the domestic market being virtually at a standstill. Even in the export market there is less doing than heretofore, despite new sales abroad. Orders in the hands of local exporters are old ones, and they will be filled before long. Export prices are holding up well, with $14 a ton delivered dock the prevailing quotation on No. 1 steel, and $12.75 on No. 2 steel. Quite a tonnage of New Haven Railroad Co. rails and track fittings is being piled up in various sections of the South Shore and Cape Cod, purchasers not being willing to move the material at going market prices.

Toronto

Trading in iron and steel scrap showed little change from the preceding week. Local dealers state that large offerings are being made and yard holdings are increasing rapidly. Sheet steel, mostly automobile scrap, is in large supply, and there has been some gain in offerings of cast scrap, consisting mostly of automobile blocks. Large consumers, including the mills have renewed contracts, but only for a month ahead and at prices prevailing during the month immediately preceding. Dealers are making good shipments of heavy melting steel to the Hamilton area, but otherwise the movement of scrap is slow.

New York

Revised estimates of the tonnage placed by the International Scrap Convention in London on May 6 range as high as 400,000 tons instead of the 200,000 tons originally reported. All the material is to be shipped from Atlantic ports, none to leave from the Gulf. About 40 per cent of the scrap is consigned to Great Britain, the rest to Italy, Sweden, Finland and Poland. As in the example of the previous commitment in early April, Germany is not represented in the new business. The prevailing price is $15 for No. 1 steel and $13.50 for No. 2. Cast iron grades and new and old bundles are also included in the contracts. Dealer buying prices are unchanged. Domestic business is practically at a standstill.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$14.00 to	$14.50
Railroad hvy. mltng...	15.00 to	15.50
No. 2 hvy. mltng. steel.	12.50 to	13.00
Scrap rails	15.50 to	16.00
Rails 3 ft. and under..	17.00 to	17.50
Comp. sheet steel	14.00 to	14.50
Hand bundled sheets..	13.00 to	13.50
Hvy. steel axle turn..	12.50 to	13.00
Machine shop turn....	8.75 to	9.25
Short shov. turn.....	9.25 to	9.75
Mixed bor. & turn.....	6.50 to	7.00
Cast iron borings	6.50 to	7.00
Cast iron carwheels...	14.50 to	15.00
Hvy. breakable cast...	12.00 to	12.50
No. 1 cupola cast.....	15.00 to	15.50
RR. knuckles & cplrs.	16.50 to	17.00
Rail coil & leaf springs	17.00 to	17.50
Rolled steel wheels....	17.00 to	17.50
Low phos. billet crops.	18.00 to	18.50
Low phos. punchings..	17.00 to	17.50
Low phos. plate	16.00 to	17.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$15.00 to	$15.50
No. 2 hvy. mltng. steel.	12.50 to	13.00
Hydraulic bund., new.	14.50 to	15.00
Hydraulic bund., old..	11.00 to	11.50
Steel rails for rolling.	17.00 to	17.50
Cast iron carwheels...	....	16.00
Hvy. breakable cast...	14.50 to	15.00
No. 1 cast	16.00 to	16.50
Stove plate (steel wks.)	....	13.00
Railroad malleable ...	15.50 to	16.00
Machine shop turn....	8.50 to	9.00
No. 1 blast furnace....	6.50 to	7.00
Cast borings	6.50 to	7.00
Heavy axle turnings..	10.00 to	10.50
No. 1 low phos. hvy...	17.00 to	17.50
Couplers & knuckles..	17.00 to	17.50
Rolled steel wheels....	17.00 to	17.50
Steel axles	20.00 to	20.50
Shafting	20.50 to	21.00
Spec. iron & steel pipe	12.00 to	12.50
No. 1 forge fire.....	12.00 to	12.50
Cast borings (chem.)..	9.50 to	10.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton	
Hvy. mltng. steel	$12.50 to	$13.00
Auto. hvy. mltng. steel alloy free	11.25 to	11.75
No. 2 auto steel	10.50 to	11.00
Shoveling steel	12.50 to	13.00
Factory bundles	12.00 to	12.50
Dealers' bundles	10.75 to	11.25
Drop forge flashings...	9.25 to	9.75
No. 1 busheling	11.25 to	11.75
No. 2 busheling, old...	5.25 to	5.75
Rolled carwheels	13.75 to	14.25
Railroad tires, cut ...	13.75 to	14.25
Railroad leaf springs..	14.00 to	14.50
Steel coup. & knuckles	13.50 to	14.00
Axle turnings	11.50 to	12.00
Coil springs	15.50 to	16.00
Axle turn. (elec.).....	13.00 to	13.50
Low phos. punchings..	15.00 to	15.50
Low phos. plates 12 in. and under	14.50 to	15.00
Cast iron borings	5.50 to	6.00
Short shov. turn.....	6.00 to	6.50
Machine shop turn....	6.00 to	6.50
Rerolling rails	16.50 to	17.00
Steel rails under 3 ft..	15.50 to	16.00
Steel rails under 2 ft..	16.00 to	16.50
Angle bars, steel	15.00 to	15.50
Cast iron carwheels ...	12.25 to	12.75
Railroad malleable	14.50 to	15.00
Agric. malleable	10.75 to	11.25
	Per Net Ton	
Iron car axles	$18.00 to	$18.50
Steel car axles	17.50 to	18.00
Locomotive tires	13.00 to	13.50
Pipes and flues	8.50 to	9.00
No. 1 machinery cast.	11.50 to	12.00
Clean auto. cast	12.50 to	13.00
No. 1 railroad cast....	10.50 to	11.00
No. 1 agric. cast	10.00 to	10.50
Stove plate	7.25 to	7.75
Grate bars	7.75 to	8.25
Brake shoes	9.00 to	9.50

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$14.00 to	$14.50
No. 2 hvy. mltng. steel.	13.00 to	13.50
Low phos. plate	15.00 to	15.50
No. 1 busheling	13.25 to	13.75
Hydraulic bundles	13.50 to	14.00
Machine shop turn....	8.00 to	8.50

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$13.00 to	$13.50
No. 2 hvy. mltng. steel	12.00 to	12.50
Comp. sheet steel	12.50 to	13.00
Light bund. stampings	9.50 to	10.00
Drop forge flashings..	11.00 to	11.50
Machine shop turn....	7.00 to	7.50
Short shov. turn.....	7.50 to	8.00
No. 1 busheling	12.50 to	13.00
Steel axle turnings....	10.50 to	11.00
Low phos. billet and bloom crops	17.50 to	18.00
Cast iron borings	7.25 to	7.75
Mixed bor. & turn....	7.25 to	7.75
No. 2 busheling	7.25 to	7.75
No. 1 cupola cast	14.50 to	15.00
Railroad grate bars ..	8.50 to	9.00
Stove plate	9.00 to	9.50
Rails under 3 ft.	17.25 to	17.75
Rails for rolling	17.50 to	18.00
Railroad malleable ...	14.50 to	15.00
Cast iron carwheels ..	13.50 to	14.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$13.50 to	$14.00
No. 2 hvy. mltng. steel.	11.50 to	12.00
Scrap rails	15.00 to	15.50
New hvy. b'ndled sheets	11.50 to	12.00
Old hydraul. bundles..	10.25 to	10.75
Drop forge flashings...	11.50 to	12.00
No. 1 busheling	11.50 to	12.00
Hvy. axle turnings....	9.50 to	10.00
Machine shop turn....	6.50 to	7.00
Knuckles & couplers..	16.00 to	16.50
Coil & leaf springs....	16.00 to	16.50
Rolled steel wheels....	16.00 to	16.50
Low phos. billet crops.	16.00 to	16.50
Shov. turnings	7.50 to	8.00
Mixed bor. & turn....	7.50 to	8.00
Cast iron borings	7.50 to	8.00
Steel car axles	16.50 to	17.00
No. 1 machinery cast..	15.00 to	16.00
No. 1 cupola cast.	14.50 to	15.00
Stove plate	13.00 to	13.50
Steel rails under 3 ft..	18.00 to	18.50
Cast iron carwheels...	13.50 to	14.00
Railroad malleable	15.00 to	15.50
Chemical borings	9.00 to	9.50

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting.	$11.75 to	$12.25
No. 1 hvy. melting....	11.50 to	12.00
No. 2 hvy. melting....	10.50 to	11.00
No. 1 locomotive tires.	12.25 to	12.75
Misc. stand. sec. rails.	13.00 to	13.50
Railroad springs	14.00 to	14.50
Bundled sheets	7.00 to	7.50
No. 1 busheling	7.50 to	8.00
Cast. bor. & turn.....	2.50 to	3.00
Machine shop turn....	3.50 to	4.00
Heavy turnings	9.00 to	9.50
Rails for rolling	16.00 to	16.50
Steel car axles	17.00 to	17.50
No. 1 RR. wrought....	9.75 to	10.25
No. 2 RR. wrought....	11.50 to	12.00
Steel rails under 3 ft..	16.00 to	16.50
Steel angle bars	13.00 to	13.50
Cast iron carwheels...	14.00 to	14.50
No. 1 machinery cast..	13.50 to	14.00
Railroad malleable ...	12.25 to	12.75
No. 1 railroad cast....	12.00 to	12.50
Stove plate	7.50 to	8.00
Grate bars	8.50 to	9.00
Brake shoes	9.50 to	10.00

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel	$10.50 to	$11.00
No. 2 hvy. mltng. steel.	8.25 to	8.75
Scrap rails for mltng.	14.00 to	14.50
Loose sheet clippings.	6.00 to	6.50
Hydrau. b'ndled sheets	10.00 to	10.50
Cast iron boring	2.75 to	3.25
Machine shop turn....	4.00 to	4.50
No. 1 busheling	6.75 to	7.25
No. 2 busheling	1.75 to	2.25
Rails for rolling	16.00 to	16.50
No. 1 locomotive tires.	12.75 to	13.25
Short rails	16.75 to	17.25
Cast iron carwheels...	12.00 to	12.50
No. 1 machinery cast..	11.50 to	12.00
No. 1 railroad cast....	11.50 to	12.00
Burnt cast	5.75 to	6.25
Stove plate	5.75 to	6.25
Agricul. malleable	10.25 to	10.75
Railroad malleable	12.75 to	13.25
Mixed hvy. cast	9.50 to	10.00

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel....	$12.50 to	$14.00
Scrap steel rails	14.50 to	15.00
Short shov. turnings..	7.50 to	8.10
Stove plate	9.00 to	10.00
Steel axles	15.00 to	16.00
Iron axles	15.00 to	16.00
No. 1 RR. wrought	....	10.00
Rails for rolling	16.00 to	16.50
No. 1 cast	....	14.50
Tramcar wheels	....	14.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. industrial steel	$9.50 to	$10.00
No. 2 hvy. mltng. steel.	8.50 to	9.00
Borings and turnings..	4.75 to	5.25
Long turnings	4.75 to	5.25
Short shov. turnings..	5.50 to	6.00
No. 1 machinery cast..	12.50 to	13.00
Automotive cast	13.00 to	13.50
Hvy. breakable cast...	9.00 to	9.50
Stove plate	7.50 to	8.00
Hydraul. comp. sheets.	10.50 to	11.00
New factory bushel....	9.50 to	10.00
Sheet clippings	6.75 to	7.75
Flashings	9.00 to	9.50
Low phos. plate scrap.	10.50 to	11.00

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel	$11.00 to	$11.50
No. 2 hvy. mltng. steel.	9.00 to	9.50
Hvy. breakable cast...	10.50 to	11.00
No. 1 machinery cast.	11.50 to	12.00
No. 2 cast	9.50 to	10.00
Stove plate	9.50 to	10.00
Steel car axles	20.00 to	20.50
Shafting	15.50 to	16.00
No. 1 RR, wrought....	11.00 to	11.50
No. 1 wrought long....	9.50 to	10.00
Spec. iron & steel pipe	9.00 to	9.50
Rails for rolling	16.00 to	16.50
Clean steel turnings*..	4.00 to	4.50
Cast borings*	3.50 to	4.00
No. 1 blast furnace....	3.50 to	4.00
Cast borings (chem.)..	9.50 to	10.00
Unprepared yard scrap	6.00 to	6.50
Light iron	3.00 to	3.50
Per gross ton, delivered local foundries:		
No. 1 machn. cast†....	$13.50 to	$14.00
No. 2 cast†	10.50 to	11.00

* $1.50 less for truck loads.
† Northern N. J. prices are $2 to $2.50 higher.

BOSTON

Dealers' buying prices per gross ton:

Breakable cast		$9.65
Machine shop turn....	$3.38 to	$4.15
Mixed bor. & turn....	2.00 to	2.25
Bun. skeleton long.....	....	7.15
Shafting	15.25 to	15.50
Cast bor. chemical....	4.50 to	5.00
Per gross ton delivered consumers' yards:		
Textile cast	$12.50 to	$14.00
No. 1 machine cast....	12.50 to	14.00
Per gross ton delivered dealers' yards:		
No. 1 hvy. mltng. steel.	$11.25 to	$11.50
No. 2 steel	10.00 to	10.25

PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$12.00 to	$13.00
No. 2 hvy. mltng. steel.	11.00 to	12.00

CANADA

Dealers' buying prices at their yards, per gross ton:

	Toronto	Montreal
No. 1 hvy. mltng. steel.	$10.00	$9.50
No. 2 hvy. mltng. steel.	8.50	8.00
Mixed dealers steel....	7.25	6.75
Drop forge flashings...	9.25	8.75
New loose clippings...	4.75	4.25
Busheling	4.50	4.00
Scrap pipe	5.75	5.25
Steel turnings	5.25	4.75
Cast borings	4.00	3.50
Machinery cast	15.25	14.25
Dealers cast	13.25	12.25
Stove plate	11.25	10.25

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges		
No. 1 hvy. mltng. steel.	$12.00 to	$12.50
No. 2 hvy. mltng. steel.	10.50 to	11.00
No. 2 cast	10.50 to	11.00
Stove plate	9.50 to	10.00
Boston on cars at Army Base or Mystic Wharf		
No. 1 hvy. mltng. steel.	$13.75 to	$14.00
No. 2 hvy. mltng. steel.	12.75 to	13.00
Rails (scrap)	13.75 to	14.00
Philadelphia, delivered alongside boats, Port Richmond		
No. 1 hvy. mltng. steel.	$15.00 to	$15.25
No. 2 hvy. mltng. steel.	13.50 to	13.75

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

Steel prices on these pages are base prices only and f.o.b. mill unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases the amount of freight which must be absorbed in order to meet competition.

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are $2 higher. F.o.b. Duluth, billets only, $2 higher.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods
(No. 5 to 9/32 in.)

	Per Gross Ton
Pittsburgh, Chicago or Cleveland	$43.00
Worcester, Mass.	45.00
Birmingham	43.00
San Francisco	52.00

Rods over 9/32 in. or 47/64 in., inclusive, $5 a ton over base.

SOFT STEEL BARS

	Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Buffalo and Birmingham	2.15c.
Detroit, delivered	2.25c.
Duluth	2.25c.
Philadelphia, delivered	2.47c.
New York	2.49c.
On cars dock Gulf ports	2.50c.
On cars dock Pacific ports	2.75c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.10c.
On cars dock Tex. Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Cleveland, Youngstown or Sparrows Pt.	1.80c. to 2.05c.
Detroit, delivered	1.90c. to 2.15c.
On cars dock Tex. Gulf ports	2.15c. to 2.40c.
On cars dock Pacific ports	2.50c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Buffalo, Cleveland, Youngstown or Birmingham	1.70c. to 1.90c.
Detroit, delivered	1.80c. to 2.00c.
On cars dock Tex. Gulf ports	2.05c. to 2.25c.
On cars dock Pacific ports	2.35c.

IRON BARS

Chicago and Terre Haute	2.15c.
Pittsburgh (refined)	3.60c.

COLD FINISHED BARS AND SHAFTING*

	Base per Lb.
Pittsburgh, Buffalo, Cleveland, Chicago and Gary	2.70c.
Detroit	2.75c.

* In quantities of 10,000 to 19,999 lb.

PLATES

	Base per Lb.
Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont, Del.	2.10c.*
Philadelphia, del'd	2.15c.
New York, del'd	2.19c. to 2.29c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.60c.
Wrought iron plates, P'tg.	3.80c.

* Subject to concessions, particularly in the East, of $2 a ton.

FLOOR PLATES

Pittsburgh or Chicago	3.35c.
New York, del'd	3.71c.
On cars dock Gulf ports	3.70c.
On cars dock Pacific ports	3.95c.

STRUCTURAL SHAPES

	Base per Lb.
Pittsburgh, Chicago, Gary, Buffalo, Bethlehem or Birmingham	2.10c.
Philadelphia, del'd	2.215c.
New York, del'd	2.27c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

STEEL SHEET PILING

	Base per Lb.
Pittsburgh, Chicago or Buffalo	2.40c.
On cars dock Gulf ports	2.85c.
On cars dock Pacific ports	2.90c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$40.00
Angle bars, per 100 lb.	2.70

F.o.b. Basing Points

Light rails (from billets) per gross ton	$40.00
Light rails (from rail steel) per gross ton	39.00

	Base per Lb.
Cut spikes	3.00c.
Screw spikes	4.55c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast ports	2.25c.
Track bolts, to steam railroads	4.15c.
Track bolts to jobbers, all sizes (per 100 counts)	65-5

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS

Hot Rolled

	Base per Lb.
Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown or Chicago	2.00c.
Detroit, delivered	2.10c.
Philadelphia, delivered	2.17c.
Granite City	2.10c.
On cars dock Pacific ports	2.50c.
Wrought iron, Pittsburgh	4.10c.

Cold Rolled*

Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown or Chicago	3.05c.
Detroit, delivered	3.15c.
Granite City	3.15c.
Philadelphia, delivered	3.37c.
On cars dock Pacific ports	3.65c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

From May 10 up to and including May 15, reductions from the base price of hot and cold rolled sheets running from $4 to $8 a ton were prevalent. Concessions withdrawn, on May 15.

Galvanized Sheets, 24 Gage

Pittsburgh, Chicago, Gary Sparrows Point, Buffalo, Middletown, Youngstown or Birmingham	3.30c. to 3.50c.
Philadelphia, delv'd	3.47c. to 3.67c.
Granite City	3.40c. to 3.60c.
On cars dock Pacific ports	4.00c.
Wrought iron Pittsburgh	6.10c.

Electrical Sheets
(*F.o.b. Pittsburgh*)

	Base per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extra plus 25c per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

Long Ternes

No. 24 unassorted 8-lb. coating f.o.b. Pittsburgh or Gary	3.80c.
F.o.b. cars dock Pacific ports	4.50c.

Vitreous Enameling Stock, 20 Gage*

Pittsburgh, Chicago, Gary, Youngstown, Middletown or Cleveland	3.35c.
Detroit, delv'd	3.45c.
Granite City	3.45c.
On cars dock Pacific ports	3.95c.

TIN MILL PRODUCTS

***Tin Plate**

	Per Base Box
Standard cokes, Pittsburgh, Chicago and Gary	$5.00
Standard cokes, Granite City	5.10

* Prices effective Nov. 10 on shipments through first quarter of 1939.

Special Coated Manufacturing Ternes

	Per Base Box
Granite City	$4.40
Pittsburgh or Gary	4.30

Roofing Terne Plate
(*F.o.b. Pittsburgh*)
(Per Package, 112 sheets, 20 x 28 in.)

8-lb. coating I.C.	$12.00
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.00
25-lb. coating I.C.	16.00
30-lb. coating I.C.	17.25
40-lb. coating I.C.	19.50

Black Plate, 29 gage and lighter

Pittsburgh, Chicago and Gary	3.05c.
Granite City	3.15c.
On cars dock Pacific ports, boxed	4.00c.

HOT ROLLED STRIP

(*Widths up to 12 in.*)

	Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown or Birmingham	2.00c.
Detroit, delivered	2.10c.

Cooperage Stock

Pittsburgh & Chicago	2.10c.

From May 10 up to and including May 15, reductins in the base price of hot rolled strip running from $4 to $8 a ton were prevalent. Concessions withdrawn on May 15.

COLD ROLLED STRIP*

	Base per Lb.
Pittsburgh, Youngstown or Cleveland	2.80c.
Chicago	2.90c.
Detroit, delivered	2.90c.
Worcester	3.00c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

Pittsburgh, Youngstown, or Cleveland	2.95c.
Detroit, delivered	3.05c.
Worcester	3.35c.

From May 10 up to and including May 15, reductions from the base price of cold rolled strip amounting to $4 a ton were prevalent. Concessions withdrawn on May 15.

COLD ROLLED SPRING STEEL

		Pittsburgh and Cleveland	Worcester
Carbon	0.26-0.50%	2.80c.	3.00c.
Carbon	0.51-0.75	4.30c.	4.50c.
Carbon	0.76-1.00	6.15c.	6.35c.
Carbon	1.01-1.25	8.35c.	8.55c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh, Chicago, Cleveland and Birmingham)

To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Galvanized wire, base	2.65c.*
Spring wire	3.20c.

* On galvanizing wire to manufacturing trade, size and galvanizing extras are charged, the price Nos. 6 to 9 gage, inclusive, thus being 3.15c.

To the Trade

	Base per Keg
Standard wire nails	$2.45
Coated nails	2.45
Cut nails, carloads	3.60

	Base per 100 Lb.
Annealed fence wire	$2.95
Galvanized fence wire	3.35
Polished staples	3.15
Galvanized staples	3.40
Twisted barbless wire	3.30
Woven wire fence, base column	67
Single loop bale ties, base col.	56
Stand. 2 pt., 12.5 gage barbed cattle wire, per 80 rod spool	$2.62
Stand. 2 pt., 12.5 gage barbed hog wire, per 80 rod spool	$2.80

Note: Birmingham base same on above items, except spring wire.

Add $4 a ton for Mobile, Ala.; $5 for New Orleans; $6 for Lake Charles to above bases, except on galvanized and annealed merchant fence wire, which are $1 a ton additional in each case.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel In.	Black	Galv.	*Wrought Iron* In.	Black	Galv.
⅛	56	36	¼ & ⅜	..+9	+30
¼	to ⅜.59	43½	½	24	6½
½	.....63½	54	¾	30	13
¾	.....66½	58	1 & 1¼	.34	19
1	to 3...68½	60½	1½	38	21½
			2	.....37½	21

Lap Weld

2	61	52½	2	.....30½	15
2½	& 3..64	55½	2½ to 3½	31½	17½
3½	to 6.66	57½	4	.....33½	21
7	& 8.65	55½	4½ to 8.	32½	20
9	& 10.64½	55	9 to 12..	28½	15
11	& 12.63½	54			

Butt weld, extra strong, plain ends

⅛	.....54½	41½	¼ & ⅜	.+10	+43
½	to ¾.56½	45½	½	25	9
½	.....61½	37½	¾	31	15
¾	.....65½	57½	1	to 2...38	22½
1	to 3...67	60			

Lap weld, extra strong, plain ends

2	59	51½	2	.....33½	18½
2½	& 3..63	55½	2½	to 4.39½	25½
3½	to 6.66½	59	4½	to 6.37½	24
7	& 8.65½	56	7	& 8..38½	24½
9	& 10.64½	55	9	to 12..32	20½
11	& 12.63½	54			

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher, on all butt weld 8 in. and smaller.

Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall.

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld Hot Rolled
1 in. o.d.....13 B.W.G.	$ 9.01	$ 7.82	....
1¼ in. o.d...13 B.W.G.	10.67	9.26	....
1½ in. o.d...13 B.W.G.	11.70	10.23	$9.72
1¾ in. o.d...13 B.W.G.	13.42	11.64	11.06
2 in. o.d.....13 B.W.G.	15.03	13.04	12.38
2¼ in. o.d...13 B.W.G.	16.76	14.54	13.79
2¼ in. o.d...12 B.W.G.	18.45	16.01	15.16
2½ in. o.d...12 B.W.G.	20.21	17.54	16.58
2¾ in. o.d...12 B.W.G.	21.42	18.59	17.54
3 in. o.d.....12 B.W.G.	22.48	19.50	18.35
3½ in. o.d...11 B.W.G.	28.37	24.62	23.15
4 in. o.d.....10 B.W.G.	35.20	30.54	28.66
4½ in o.d...10 B.W.G.	43.04	37.35	35.22
5 in. o.d..... 9 B.W.G.	54.01	46.87	44.25
6 in. o.d..... 7 B.W.G.	82.93	71.96	68.14

Extras for less carload quantities:

40,000 lb. or ft. over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago	$51.00
6-in. and larger, del'd New York	49.00
*6-in. and larger, Birmingham	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	52.00
F.o.b. dock, Seattle	52.00
4-in. f.o.b. dock, San Francisco or Los Angeles	55.00
F.o.b. dock, Seattle	52.00

Class "A" and gas pipe, $3 extra
4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $42, Birmingham, and $50 delivered Chicago and 4-in. pipe, $45, Birmingham, and $54 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland Birmingham or Chicago)

	Per Cent Off List
Machine and carriage bolts:	
½ in. & 6 in. and smaller	68½
Larger and longer up to 1 in.	66
1⅛ in. and larger	64
Lag bolts	66
Plow bolts, Nos. 1, 2, 3 and 7	68½
Hot pressed nuts, and c.p.c. and t-nuts, square or hex. blank or tapped:	
½ in. and smaller	67
9/16 in. to 1 in. inclusive	64
1⅛ in. and larger	62

On the above items with the exception of plow bolts, there is an additional allowance of 10 per cent for full container quantities.

On all of the above items, there is an additional 5 per cent allowance for carload shipments.

Semi-fin. hexagon nuts	U.S.S.	S.A.E.
½ in. and smaller	67	70
9/16 to 1 in.	64	65
1⅛ in. and larger	62	62

In full container lots, 10 per cent additional discount.

Stove bolts in packages, nuts attached	72½
Stove bolts in packages, with nuts separate	72½ and 12½
Stove bolts in bulk	84

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½ in. and larger)

Base Per 100 Lb.

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham $3.40

Small Rivets

(7/16 in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland Chicago, Birmingham ....65 and 10

Cap and Set Screws

(Freight allowed to destination)

Per Cent Off List

Milled hexagon head, cap screws, 1 in. dia. and smaller	50 and 10
Milled headless set screws, cut thread ¾ in. and smaller	70
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	67½
Upset set screws, cup and oval points	75
Milled studs	60

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $56.00 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	2.70c.
Delivered, Detroit	2.80c.

S.A.E. Series Numbers	Alloy Differential per 100 Lb.
200 (1½% Nickel)	$0.35
2100 (1½% Nickel)	$0.75
2300 (3½% Nickel)	1.55
2500 (5% Nickel)	2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.85
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel - molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni.)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.40c. base per lb. Delivered Detroit, 3.50c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets	26.50c.	29c.	32.50c.	36.50c.
Hot Strip	17c.	17.50c.	23c.	28c.
Cold stp.	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	23c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, export	Nominal
Tin plate, per base box	20s. 3d. to 21s. 6d.
Steel bars, open hearth	£10 8s.
Beams, open-hearth	£10
Channels, open hearth	£10 5s.
Angles, open-hearth	£10
Black sheets, No. 24 gage	£13
Galvanized sheets, No. 24 gage	£15 15s.

CONTINENTAL

Per Gross Ton, Gold £,
f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet Bars	Nominal
Plate ¼ in. and up	£5 7s.
Plate 3/16 in. and 5 mm.	£5 13s.
Sheets ⅛ in.	£5 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£5 12s.

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$22.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	22.00
Delivered Brooklyn	24.50
Delivered Newark or Jersey City	23.53
Delivered Philadelphia	22.84
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown	21.00
F.o.b. Buffalo	21.00
F.o.b. Detroit	21.00
Southern, delivered Cincinnati	21.06
Northern, delivered, Cincinnati	21.44
F.o.b. Duluth	21.50
F.o.b. Provo, Utah	19.00
Delivered, San Francisco, Los Angeles or Seattle	24.50
F.o.b. Birmingham*	17.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	$21.50
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	21.50
F.o.b. Buffalo	20.00
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown	20.50
Delivered Philadelphia	22.34
Delivered Canton, Ohio	21.89
Delivered Mansfield, Ohio	22.44
F.o.b. Birmingham	16.00

Bessemer

F.o.b. Buffalo	$22.00
F.o.b. Everett, Mass.	23.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	23.00
Delivered Newark or Jersey City	24.53
Erie, Pa., and Duluth	22.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown	21.50
F.o.b. Birmingham	22.00
Delivered Cincinnati	22.11
Delivered Canton, Ohio	22.89
Delivered Mansfield, Ohio	23.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	26.50

Gray Forge

Valley or Pittsburgh furnace	$20.50

Charcoal

Lake Superior furnace	$25.00
Delivered Chicago	28.34

Canadian Pig Iron

Per Gross Ton

Montreal

Foundry Iron	$24.50 base
Malleable	25.00 base
Basic	24.50 base

Toronto

Foundry iron	$22.50 base
Malleable	23.00 base
Basic	22.50 base

On all grades 2.25 per cent silicon and under is base. For each 25 points of silicon over 2.25 per cent an extra of 25c. is charged.

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload)	$80.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	$28.00
Domestic, 26 to 28%	33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk)	$69.50*
50% (ton lots in 50 gal. bbl.)	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50%	$30.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of maganese over 2%, $1 per ton additional. Phosphorus 0.75% or over, $1 per ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 6.50%	$24.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-Manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon	$83.00
2.50% carbon	88.00
2% carbon	93.00
1% carbon	103.00

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	$1.75
Ferrotungsten, 100 lbs. and less	2.00
Ferrovanadium, contract, per lb. contained V., delivered	$2.70 to $2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots	$2.25†
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	$157.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, $3 unitage, freight equalized with Nashville	$75.00
Ferromolybdenum, per lb. Mo. f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo. f.o.b. furnace	80c.
Molybdenum oxide briquettes 48-52% Mo; per lb. contained Mo. f.o.b. Langeloth, Pa.	80c.

* Spot prices are $5 per ton higher.
† Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$5.25
Old range, non-Bessemer, 51.50%	5.10
Messabi, Bessemer, 51.50%	5.10
Messabi, non-Bessemer, 51.50%	4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria	12c.
Iron, low phos., Swedish, average, 68½% iron	12c.
Iron, basic or foundry, Swedish, aver. 65% iron	11c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	29c.
Man., African, Indian, 44-48%	25c.
Man., African, Indian, 49-51%	28c.
Man., Brazilian, 46 to 48%	27c

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered	$19.25
Tungsten, domestic, scheelite delivered	$16.00 to $18.00
Chrome or (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	$15.00
Rhodesian, 45%	19.00
Rhodesian, 48%	22.50
Turkish, 48-49%	22.50
Turkish, 45-46%	19.00
Turkish, 40-44%	17.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%	$25.00
48-49%	23.50

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$18.00
Domestic, f.o.b. Ohio River landing barges	19.00
No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines	19.00
Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	21.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	31.50

FUEL OIL

Per Gal.

No. 2, f.o.b. Bayonne	3.75c.
No. 6, f.o.b. Bayonne	2.26c.
No. 5 Bur. Stds., del'd Chicago	3.25c.
No. 6 Bur. Stds., del'd Chicago	2.75c.
No. 3 distillate, del'd Cleve'd.	5.50c.
No. 4 industrial, del'd Cleve'd.	5.25c.
No. 5 industrial, del'd Cleve'd.	3.00c.
No. 6 industrial, del'd Cleve'd.	2.75c.

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, Prompt	$3.75
Furnace, f.o.b. Connellsville, Prompt	$4.75 to 5.50
Foundry, by - product, Chicago ovens	10.25
Foundry, by - product, del'd New England	12.50
Foundry, by - product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by - product, Philadelphia	10.95
Foundry, by - product, delivered Cleveland	10.30
Foundry, by - product, delivered Cincinnati	9.75
Foundry, Birmingham	7.50
Foundry, by - product, del'd St. Louis industrial district	10.75 to 11.00
Foundry, from Birmingham, f.o.b. cars dock Pacific ports	14.75

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

	Base per Lb.
***Plates	3.55c.
***Shapes	3.55c.
***Soft steel bars and small shapes	3.60c.
***Reinforcing steel bars	2.70c.
stock	3.70c.
Cold finished bars and screw stock	3.70c.
***Hot rolled strip	3.75c.
***Hot rolled sheets	3.50c.
Galv. sheets (24 ga.) 500 lb. to 1499 lb.	4.50c.
Wire, black, soft annealed	3.15c.
Wire, galv., soft	3.55c.
Track spikes (1 to 24 kegs)	3.60c.
Wire nails (in 100-lb kegs)	2.65c.

On plates, structurals, bars, strip and hot rolled sheets, base applied to orders of 400 to 1999 lb.

** On reinforcing bars base applies to orders of less than one ton and includes switching and carting charge.

* All above prices for delivery within the Pittsburgh switching district

*** For the time being, these prices are purely nominal as concessions ranging from $3 to $5 a ton on these products have been made recently on local sales.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	3.76c.
Structural shapes	3.75c.
Soft steel bars, round	3.94c.
Iron bars, Swed. charcoal	7.50 to 8.25c.
Cold-fin, shafting and screw stock:	
Rounds, squares, hexagons	4.14c.
Flats up to 12 in. wide	4.14c.
Cold-rolled strip, soft and quarter hard	3.66c.
Hot-rolled strip, soft O.H.	4.11c.
*Hot-rolled sheets (8-30 ga.)	3.40c.
Galv. sheets (24 ga.)	4.50c.
Long ternes (24 ga.)	5.50 to 6.20c.
Cold-rolled sheets (20 ga.)	
Standard quality	4.60c.
Deep drawing	4.85c.
Stretcher leveled	5.10c.
SAE, 2300, hot-rolled	7.50c.
SAE, 3100, hot-rolled	6.10c.
SAE, 6100, hot-rolled annealed	10.25c.
SAE, 2300, cold-rolled	8.69c.
SAE, 3100, cold-rolled, annealed	7.29c.
Floor plate, ⅛ in. and heavier	5.43c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.65c.
Wire, galv. (No. 9)	5.00c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, per keg in 25 keg lots	$2.90

*For lots less than 2000 lb.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.55c.
Soft steel bars, rounds and angles	3.60c.
Soft steel squares, hexagons, channels and Tees	3.75c.
Hot rolled strip	3.75c.
Floor plates	5.15c.
Hot rolled sheets	3.50c.
Galvanized sheets	4.50c.
Cold rolled sheets	4.45c.
Cold finished carbon bars	3.80c.

Above prices are subject to deductions and extras for quantity and are f.o.b. consumer's plant within Chicago free delivery zone.

CLEVELAND

	Base per Lb.
Plates	3.55c.
Structural shapes	3.73c.
Soft steel bars	3.50c.
Reinfor. bars (under 2000 lb.)†	2.55c.
Cold-fin. bars (1000 lb., over)	3.80c.
Hot-rolled strip	3.65c.
Cold rolled sheets	4.70c.
Cold-finished strip	3.35c.
Galvanized sheets (No. 24)	4.62c.
Hot-rolled sheets	3.50c.
Floor plates, 3/16 in. and heavier	5.33c.
*Black ann'l'd wire, per 100 lb.	$3.10
*No. 9 galv. wire, per 100 lb.	3.50
*Com. wire nails, base per keg	2.60
Hot rolled alloy steel (3100)	6.05c.
Cold rolled alloy steel (3115)	6.85c.

* For 5000 lb. or less.

† 500 lb. base quantity.

Prices shown on hot rolled bars, strip, sheets, shape sand plates are for 400 to 1999 lb. Alloy steel, 1000 lb. and over; galvanized sheets, 150 to 1499 lb.; cold rolled sheets, 399 lb. and under.

ST. LOUIS

	Base per Lb.
Plates and structural shapes	3.47c.
Bars, soft steel (rounds and flats)	3.72c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	3.87c.
Cold fin. rounds, shafting, screw stock	4.07c.
Galv. sheets (24 ga.)	4.53c.
Hot rolled sheets	3.53c.
Galv. corrugated sheets, 24 ga. and heavier*	4.58c.
Structural rivets	5.02c.

* No. 26 and lighter take special prices.

BOSTON

	Base per Lb.
Structural shapes, 3 in. and larger	5.85c.
Plates, ¼ in. and heavier	3.85c.
Bars	3.98c.
Heavy hot rolled sheets	3.86c.
Hot rolled sheets	4.21c.
Hot rolled annealed sheets	4.76c.
Galvanized sheets	4.76c.
Cold rolled sheets	4.93c.

The following quantity differentials apply: Less than 100 lb., plus $1.50 per 100 lb.; 100 to 399 lb. plus 50c.; 400 to 1999 lb. base; 2000 to 9999 lb. minus 20c.; 10,000 to 39,999 lb. minus 30c.; 40,000 lb. and over minus 40c.

BUFFALO

Plates	3.77c.
Floor plates	5.40c.
Struc. shapes	3.55c.
Soft steel bars	3.60c.
Reinforcing bars (20,000 lb. or more)	2.05c.
Cold-fin. flats, squares, rounds, and hex.	3.80
Hot-rolled sheets, 3/16 x 14 in. to 48 in. wide incl. also sizes No. 8 to 30 ga.	3.50c.
Galv. sheets (24 ga.)	4.50c.
Bands and hoops	3.97c.

NEW ORLEANS

	Base per Lb.
Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	3.55
Bolts and nuts, per cent off list	60

REFRACTORIES PRICES

Fire Clay Brick

	Per 1000 f.o.b. Works
Super-duty brick, at St. Louis	$60.80
First quality Pennsylvania, Maryland, Kentucky, Missouri and Illinois	47.50
First quality, New Jersey	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	42.75
Second quality, New Jersey	49.00
No. 1, Ohio	39.90
Ground fire clay, per ton	7.10

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$47.50
Chicago District	55.10
Birmingham	47.50
Silica cement per net ton (Eastern)	8.55

Chrome Brick

	Net per Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	$47.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	47.00

Magnesite Brick

	Net per Ton
Standard f.o.b. Baltimore and Chester	$67.00
Chemically bonded, f.o.b. Baltimore	57.00

Grain Magnesite

	Net per Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	$45.00
Domestic, f.o.b. Baltimore and Chester in sacks	40.00
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00

PHILADELPHIA

	Base per Lb
*Plates, ¼-in. and heavier	3.40c.
*Structural shapes	3.40c.
*Soft steel bars, small shapes, iron bars (except bands)	3.60c.
‡Reinforc. steel bars, square and deformed	2.61c.
Cold-finished steel bars	4.11c.
*Steel hoops	4.10c
*Steel bands, No. 12 and 3/16 in. incl.	3.60c.
*Spring steel	4.75c.
†Hot-rolled anneal. sheets	3.40c.
†Galvanized sheets (No. 24)	4.43c.
*Diam. pat. floor plates, ¼ in.	5.00c.

These prices are for delivery in Philadelphia trucking area.

*For quantities between 400 and 1999 lb.

†For 10 bundles or over.

‡For one to five tons.

BIRMINGHAM

	Base per Lb.
Bars and bar shapes	3.50c.
Structural shapes and plates	3.45c.
Hot rolled sheets No. 10 ga.	3.40c.
Galvanized sheets No. 24 ga.	4.75c.
	or more
Strip	3.65c.
Reinforcing bars	3.50c.
Floor plates	5.83c.
Cold finished bars	4.73c.
Machine and carriage bolts	50 & 10 off list
Rivets (structural)	$4.60 base

On plates, shapes, bars, hot-rolled strip heavy hot-rolled sheets, the base applies on 400 to 3999 lb. All prices are f.o.b. consumer's plant

PACIFIC COAST

	Base per Lb		
	San Francisco	Los Angeles	Seattle
Plates, tanks and U. M.	3.60c.	4.00c.	3.40c.
Shapes, standard	3.60c.	4.00c.	3.40c.
Soft steel bars	3.65c.	4.00c.	3.65c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.275c.	open.	2.975c.
Hot-rolled sheets (No. 10)	3.60c.	4.20c.	3.95c.
Galv. sheets (No. 24 and lighter)	5.15c.	4.75c.	4.75c.
Galv. sheets (No. 22 and heavier)	5.40c.	4.75c.	4.75c.
Cold-finished steel			
Rounds	6.55c.	6.60c.	7.10c.
Squares and hexagons	7.80c.	7.85c.	7.10c.
Flats	8.30c.	8.35c.	8.10c.
Common wire nails—base per keg less carload	$3.00	$2.85	$3.00

All items subject to differentials for quantity.

ST. PAUL

	Base per Lb
Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.83c.
Hot-rolled annealed sheets, No. 24	4.75c.
Galvanized sheets, No. 24	5.00c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

DETROIT

	Base per Lb
Soft steel bars	3.43c.
Structural shapes	3.80c.
Plates	3.75c.
Floor plates	5.42c.
Hot-rolled sheets, 8 to 30 gages above 12 in. and 3/16 in., 24 in. to 48 in. wide	3.58c.
Cold-rolled sheets	4.65c.
Galvanized sheets	4.74c.
Hot-rolled strip, under No. 12	3.83c.
Hot-rolled strip, No. 12 and over	3.58c.
Cold-finished bars	3.85c.
Cold-rolled strip	3.55c.
Hot-rolled alloy steel (SAE 3100 Series)	6.17c.

Quantity extras apply to all items.

FABRICATED STEEL

. . . Lettings in small volume at 10,350 tons as against 28,650 tons last week . . . New projects advance to 16,300 tons from 12,750 tons a week ago . . . Plate awards call for 880 tons.

NORTH ATLANTIC STATES
AWARDS

1800 Tons, Boston, extension to Navy Yard structural shop, to Belmont Iron Works, Philadelphia.

550 Tons, East Greenbush, N. Y., Central School building, to Utica Structural Steel Co., Utica, N. Y.

425 Tons, New York, trestle and platforms, Harlem Speedway, to Bethlehem Steel Co., Bethlehem, Pa.

425 Tons, Bingham and Windham, Conn., three bridges, to American Bridge Co., Pittsburgh.

400 Tons, Little Falls, N. J., four State bridges, to American Bridge Co., Pittsburgh.

375 Tons, Fallston, Pa., State railroad bridge for Pennsylvania & Lake Erie Railroad, to American Bridge Co.

345 Tons, Beaver County, Pa., bridge, route 204, to American Bridge Co., Pittsburgh.

275 Tons, Philadelphia, crane runway for Navy Yard pickling plant, to Belmont Iron Works, Philadelphia.

225 Tons, Emporium, Pa., electrical equipment manufacturing plant, to Bethlehem Fabricators, Inc., Bethlehem, Pa.

200 Tons, Brooklyn, bridges, Bay Parkway and 26th Avenue, to Harris Structural Steel Co., Plainfield, N. J.

120 Tons, Brooklyn, News Syndicate building addition, to Lehigh Structural Steel Co., Allentown, Pa.

THE SOUTH

500 Tons, Mount Pleasant, Tenn., Victor Chemical Co. plant extension, to Ingalls Iron Works Co., Birmingham.

235 Tons, Falls County, Tex., bridge, to Austin Brothers, Dallas, Tex.

225 Tons, Nitro, W. Va., buildings for American Viscose Corp., to Lehigh Structural Steel Co., Allentown, Pa.

115 Tons, State of Texas, Middle River and intra-coastal waterway bridges, to Nashville Bridge Co., Nashville, Tenn.

100 Tons, Nashville, Tenn., laundry, to Nashville Bridge Co., Nashville, Tenn.

CENTRAL STATES

510 Tons, Minneapolis, Minn., Fridley water softening plant, to Minneapolis-Moline Power Implement Co., Minneapolis.

450 Tons, Woodstock, Ill., manufacturing building for Electric Auto Lite Co., to Bethlehem Steel Co., Bethlehem, Pa.

225 Tons, Columbus, Ohio, Goodale Street bridge to Bethlehem Steel Co., Bethlehem, Pa.

190 Tons, Lawrenceburg, Ind., plant addition for Joseph E. Seagram & Son, to International Steel Co., Evansville, Ind.

150 Tons, Oxford, Ohio, Miami University women's dormitory, to Ohio Structural Steel Co., Newton Falls, Ohio, through James Barnes Construction Co.

125 Tons, Fort Wayne, Ind., bridge, to Pan American Bridge Co., New Castle, Ind.

WESTERN STATES

1000 Tons, Los Angeles, Ducommun Metals plant, to Consolidated Steel Corp., Los Angeles.

910 Tons, Vernon, Cal., warehouse, to Consolidated Steel Corp., Los Angeles.

156 Tons, Renton, Wash., Cedar River bridge, to Pacific Car & Foundry Co., Seattle, through David Nygren, to Seattle contractor.

110 Tons, Ventura, Cal., high school auditorium, to Pennsylvania Iron & Steel Co., Los Angeles.

105 Tons, Palm Springs, Cal., bridge and undercrossing, to Bethlehem Steel Co., Los Angeles, through Dimmitt & Taylor, Los Angeles, contractor.

100 Tons, Alameda, Cal., telephone building, to Judson-Pacific Co., San Francisco.

PENDING STRUCTURAL PROJECTS

NORTH ATLANTIC STATES

2800 Tons, Lenox, Mass., grandstand, clubhouse and club grandstand for Lenox Racing Association.

700 Tons, Bedford and Westmoreland Counties, Pa., two bridges for Pennsylvania Turnpike Commission; bids May 19.

550 Tons, Danielson, Conn., manufacturing plant for V. La Rosa & Sons, Inc.

525 Tons, New York, turbine supports for Consolidated Edison Co.

450 Tons, Brooklyn, building, Georgia and Cosine Streets for Treasury Department.

400 Tons, Elmira, N. Y., reformatory cell block; bids resubmitted June 1.

300 Tons, Long Branch, N. J., Monmouth Memorial Hospital building.

175 Tons, Cumberland, Md., building for McCrory Stores Corp.

170 Tons, Franklin County, Pa., bridges for Pennsylvania Turnpike Commission; bids May 26.

120 Tons, Wyoming County, Pa., bridge on Route No. 11; bids May 26.

110 Tons, Massena, N. Y., highway bridge.

THE SOUTH

600 Tons, New Orleans, addition to Tulane University stadium.

550 Tons, San Antonio, Tex., airplane factory; bids in.

120 Tons, Nortonville, Ky., State bridge.

CENTRAL STATES

2215 Tons, Chicago, bridge, Burr Oak Avenue, for Rock Island Railroad; bids in.

900 Tons, Cleveland, Central High School; bids about June 15.

500 Tons, Cleveland, Howell School; bids soon.

420 Tons, Akron, Ohio, railroad State crossing elimination; bids May 26.

175 Tons, Dayton, Ohio, building, Wright Field.

165 Tons, Peoria, Ill., research building, Department of Agriculture, bids in.

150 Tons, Delaware, Ohio, Fair building and grandstand.

150 Tons, Chicago, garage for Chicago Tribune Co.

125 Tons, Cincinnati, Longview Hospital buildings.

125 Tons, Agnew, Ill., State grade separation.

115 Tons, Ashland, Wis., post office.

110 Tons, Lucas County, Ohio, State crossing elimination in Ottawa Hills village; bids May 26.

Unstated Tonnage, Cleveland, municipal light plant.

WESTERN STATES

1500 Tons, Odair, Wash., Grand Coulee dam work.

1479 Tons, Woodland, Wash., Lewis River bridge; bids May 23.

350 Tons, Great Falls, Mont., civic center building.

250 Tons, Oakland, Cal., Chrysler plant.

Unstated Tonnage, Odair, Wash., Grand Coulee power plant roof frame; bids June 2.

Unstated Tonnage, Santa Monica, Cal., Douglas Aircraft plant; bids in.

FABRICATED PLATES

AWARDS

675 Tons, Odair, Wash., Spec. No. 832, pier plates for drum gates, Grand Coulee Dam, to American Bridge Co.

205 Tons, Philadelphia, Petrol Corp., 55,000 bbl. oil storage tank, to Chicago Bridge & Iron Co., Chicago.

PENDING PROJECTS

300 Tons, San Francisco, oil tanks.

Unstated Tonnage, Toledo, 16,000 ft. of 108-in. pipe for Lake intake section; bids about June 14.

SHEET PILING

AWARDS

665 Tons, Los Angeles, bearing piles for United States Engineer (Proposal 215), to Columbia Steel Co., San Francisco.

PENDING PROJECTS

1400 Tons, East Hartford, Conn., dike.

1200 Tons, West Springfield, Mass., dike.

TRADE NOTES

Link-Belt Co. has contracted for construction of a new one-story office and warehouse building, 105½ ft. x 225 ft. in Dallas, Tex., where the company's Southwestern headquarters are located.

Emerson Electric Mfg. Co., St. Louis, has moved its New York district office to the Graybar Building, 420 Lexington Avenue, New York.

Dirksen Screw Products Co., recently organized in Detroit by Paul Dirksen, president, has opened a shop at 1155 Bellevue Avenue, Detroit. O. Durocher is general manager. The company will manufacture small screw machine products and specialties of steel, brass, bronze copper and aluminum.

The Philip G. Smith Co. has moved to 1331 Book Building, Detroit. Its warehouse and yard will be located at Outer Drive and Pennsylvania Railroad, Melvindale, Mich.

Progressive Welding Co., 293 Hudson Street, Hackensack, N. J., electric arc and acetylene welding, is moving to new and larger building at River and Marion Streets. George Loers heads company.

The Korfund Co., Inc., Long Island City, N. Y., announces that sales, service and installation of Korfund anti-vibration products in western Pennsylvania is now handled exclusively by the Dravo Corp., Pittsburgh.

A. P. de Sanno & Son have moved their general office and factory from Philadelphia to the Phoenixville, Pa., plant where the vitrified, resinoid, shellac, and mounted point departments and research laboratories have been enlarged.

Martin Stamping & Stove Co., of Florence, Ala., a newly organized company, has purchased the properties of the old Southern Metal Products Co. at Huntsville, Ala., and will manufacture electric stoves and sheet steel products.

Reynolds Molded Plastics, a division of the Reynolds Spring Co., Jackson, Mich., has established a sales office in Cleveland, 601 Hanna Building. The new office will concentrate on the sales of plastic articles in Ohio. Robert R. Wilson will be in charge of the branch and responsible for the Ohio territory.

The industrial division of the DeVilbiss Co. has moved its New York sales and service branch to 111 Eighth Avenue in the Port Authority Commerce Building.

Kasenit Co., maker of a compound for surface hardening of steel, has moved its office to 799 Greenwich Street, New York.

The Chicago Pulley & Shafting Co., 17-23 North Desplaines Street, Chicago, has been appointed distributer of Ajax Flexible Couplings.

Quality Hardware & Machine Co., 5841 Ravenswood Avenue, Chicago, has taken over the Modern motor drive which is designed to convert lineshaft drives on cone pulley machines to individual motor drives.

. . . NON-FERROUS . . .

. . . Copper quiet at 10c. a lb., as consumers look to Europe for action . . . Lead consumers only about 50 per cent covered for June . . . Spelter enjoys good demand with nearby change in price unlikely . . . Tin quiet.

NEW YORK, May 16—The market for copper remains quiet as both consumers and producers in this country look to Europe to give a lead as to what may be expected over the next several weeks. The spurt of buying which followed the reduction in price to 10c. a week ago has died out, and the price for the red metal remains today at 10c. a lb., delivered Connecticut Valley. The London market was lower this morning, with metal available at 10.05c. a lb., c.i.f., but sales were spotty and not in large volume. Aggregate sales through May 13 amounted to 33,896 tons, a fairly satisfactory volume. Consumers are covered until the middle of July, and the next few weeks will probably show additional covering of a modest nature.

World copper stocks of 522,722 tons as of the end of April, represented an increase of 12,630 tons, according to statistics of the Copper Institute, of which the domestic industry, with 332,513 tons, contributed 11,701 tons; the foreign section, with 190,209 tons, added 929 tons.

Lead

Consumer demands for lead continue the active pace of the past two weeks, although general turnover today is somewhat under the level of a week ago. Consumers are not too well covered, that is June requirements are probably not more than 50 per cent accounted for. This indicates that further buying is in prospect, although most users are showing no hurry to enter commitments because there is little fear of a price advance. London prices are at a low level, in the neighborhood of 3.07c., and this has created some fear of importation of metal, although there appears to be no great danger of this. None the less the position has served to keep the domestic price down to 4.75c. a lb., New York.

Lead ore prices in the Joplin market are holding steady and unchanged at $52.94 for contract sales and $51 to $52 for open market car lots. Shipments are showing a slight decrease and stocks also are slightly lower.

Zinc

The market for spelter is in an excellent shape, there being general buying throughout the market and a satisfactory statistical position. The condition of the London market has served to hold back price advances here. The domestic level continues at 4.50c. a lb., East St. Louis. Sales of prime Western metal last week amounted to 3436 tons, shipments totaled 3911 tons, and the aggregate of undelivered contracts is somewhat lower at 29,635 tons.

Tin

Despite a stagnant sales situation during the past week, the market has held quite steady. A few carlots of speculative metal were disposed of during the week, and served somewhat to move the market down pricewise. With tin plate makers operating at 70 per cent, consumption of tin is quite high, and users are believed not to be any too well covered against forward requirements. The New York price for Straits metal drifted down slowly but steadily during the past seven days, and today's price was in the neighborhood of 48.875c. a lb.

NON-FERROUS PRICES

Cents per lb. for early delivery

	May 10	May 11	May 12	May 13	May 15	May 16
Copper, Electrolytic[1]	10.00	10.00	10.00	10.00	10.00	10.00
Copper, Lake	10.00	10.00	10.00	10.00	10.00	10.00
Tin, Straits, New York	49.25	49.25	49.00	....	48.875	48.875
Zinc, East St. Louis[2]	4.50	4.50	4.50	4.50	4.50	4.50
Lead, St. Louis[3]	4.60	4.60	4.60	4.60	4.60	4.60

[1] Delivered Conn. alley, deduct ¼c. from New York delivery. [2] Add 0.39c. for New York delivery. [3] Add 0.15c. for New York delivery.

Warehouse Prices

Cents per lb., Delivered

	New York	Cleveland
Tin, Straits pig	50.00c.	52.00c.
Copper, Lake	11.25c.	11.125c.
Copper, electro	11.125c.	11.125c.
Copper, Castings	10.75c.	10.875c.
•Copper sheets, hot-rolled	18.12c.	18.12c.
•High brass sheets	16.48c.	16.48c.
•Seamless brass tubes	19.23c.	19.23c.
•Seamless copper tubes	18.62c.	18.62c.
•Brass rods	11.85c.	11.85c.
Zinc slabs	6.15c.	6.90c.
Zinc sheets, No. 9 casks	10.50c.	12.10c.
Lead, American pig	5.75c.	5.60c.
Lead, bar	6.35c.	8.25c.
Lead, sheets, cut	8.00c.	8.00c.
Antimony, Asiatic	15.00c.	17.00c.
Alum., virgin, 99 per cent plus	22.50c.	22.50c.
Alum., No. 1 remelt., 98 to 99 per cent	19.50c.	19.50c.
Solder, ½ and ½	29.50c.	29.75c.
Babbitt metal, commercial grade	21.50c.	21.75c.

• These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 1/3; on brass sheets and rods, 40, and on brass and copper tubes, 25.

Old Metals

Cents per lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.875c.	9.625c.
Copper, hvy. and wire	6.875c.	7.375c.
Copper, light and bottoms	6.125c.	6.375c.
Brass, heavy	4.125c.	4.625c.
Brass, light	3.25c.	4.00c.
Hvy. machine composition	6.125c.	7.625c.
No. 1 yel. brass turnings	4.00c.	4.50c
No. 1 red brass or compos. turnings	5.875c.	6.50c.
Lead, heavy	3.625c.	4.50c.
Cast aluminum	6.50c.	7.75c.
Sheet aluminum	12.25c.	13.75c.
Zinc	2.125c.	3.375c.

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered; virgin, 99 per cent plus, 20c.-21c. a lb.; No. 12 remelt No. 2 standard, 19c.-19.50c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt, New York; Asiatic, 14c. a lb., f.o.b.; American, 11.50c. a lb. QUICKSILVER, commercial 85-5-5-5, 10.25c. a lb. SILVER, $94 per flask of 76 lb. BRASS

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

Socony-Vacuum Oil Co., Inc., 26 Broadway, New York, has begun expansion and improvements in oil refinery of White Eagle Oil Corp. division at Augusta, Kan., to include new gasoline recovery unit; extensions in cracking department for gasoline production, and enlargement of other divisions, including steel tank storage and distribution facilities. Cost about $3,000,000. Company also has arranged for an interest in new oil refinery of Glazier Production Co., Cut Bank, Mont., now in course of erection, and plans will be completed at once for expansion in original proposed capacity of crude oil daily, to be furnished under agreement with Producers Refining Co., Cut Bank, from Montana oil field. Additional processing and other equipment will be installed, also steel tank storage units and other operating facilities. Cost reported over $500,000.

Hygrade Products Co., 516 West Thirty-fourth Street, New York, manufacturer of automobile accessories and equipment, has acquired a three-story building at 35 Thirty-fifth Street, Long Island City, 90 x 130 ft., for new plant. Present works will be removed to new location and capacity increased.

Commanding Officer, Ordnance Department, Watervliet Arsenal, Watervliet, N. Y., asks bids until May 26 for alloy steel forgings, breech rings and hoops for 155 mm. guns (Circular 216).

Corn Products Refining Co., 17 Battery Place, New York, corn oils, dextrine, etc., has let general contract to Bedford Construction Co., 333 North Michigan Avenue, Chicago, for three additions to branch plant at Tenth and Bedford Streets, North Kansas City, Mo., consisting of two two-story structures and one-story top addition to existing building. Cost over $100,000 with equipment. N. M. McKenzie, Chicago offices of company, 333 North Michigan Avenue, is chief engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 26 for one motor-driven milling machine and shaper (Schedule 6276); until May 23, one five-ton suspended platform type beam scale (Schedule 6285) for Brooklyn Navy Yard; hacksaw blades (Schedule 6203) for Brooklyn, Norfolk and Mare Island yards; four boat crane hoisting, rotating and topping equipments, with spare parts (Schedule 6298) for Brooklyn and Philadelphia yards.

Great Lakes Carbon Corp., 30 Rockefeller Plaza, New York, recently organized by officials of Great Lakes Coal & Coke Co., same address, with main offices at 910 South Michigan Avenue, Chicago, will begin erection soon of new plant on 15-acre tract at Fifty-sixth Street and Pine Avenue, near city limits of Niagara Falls, N. Y., lately acquired, for production of carbon and graphite electrodes. Facilities will be provided for employment of about 150 men. B. E. Broadwell, Lewiston, N. Y., consulting engineer, formerly general manager of Republic Carbon Corp., will supervise plant erection and operations. George Skakel is president.

Purchasing and Contracting Officer, Quartermaster Corps, Schenectady, N. Y., asks bids until May 25 for one steel magazine feed boiler unit, and furnishing and erecting 48-in. dia. by 70-ft. high steel smoke stack (Circular 5222-7).

Hills Brothers Coffee, Inc., 2 Harrison Street, San Francisco, has let contract to Austin Co., Cleveland, engineer and contractor, for new branch plant at Edgewater, N. J., consisting of a large, two, three and four-story unit, with 14-ft. tower, for mixing, blending, roasting, packing, storage and distribution, totaling about 225,000 sq. ft. of floor space. Cost over $600,000 with machinery, including mechanical-handling equipment for bulk loading and other service.

Commanding Officer, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until May 22 for one powder cutting machine (Circular 743), three acid and moisture-proof fans, and three stainless steel vane louvres (Circular 816), 33,000 small steel forgings (Circular 807); until May 23 for gages, including flush pin, plain plug, thread ring, etc. (Circular 808); until May 24, gages, similar to types noted (Circular 809); until May 25, 62,000 eccentric gears, 31,000 external gears, 31,000 internal gears and 31,000 drive gears (Circular 803).

Barrett Co., Margaret and Bermuda Streets, Philadelphia, chemical products, plans one and multi-story addition for production of synthetic phenol, used in plastics manufacture. Cost over $250,000 with equipment. Company is a subsidiary of Allied Chemical & Dye Corp., New York.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until May 23 for one electric oven, 18 x 18 x 18 in., inside dimensions (Circular 1130), one, two or three drying machines (Circular 1133); until May 24, two motor-driven drill presses (Circular 1135).

NEW ENGLAND

United States Engineer Office, Providence, R. I., asks bids until May 26 for pumping station equipment, including three 36-in. gasoline engine-driven pumps, one 16-in. motor-driven pump, and three right-angle gear units (Circular 295).

Davenport Garnet Co., South Danbury, N. H., manufacturer of abrasives, sandblast materials, etc., has purchased plant of Atlas Chemical Co., Waltham, Mass., comprising several buildings with about 40,000 sq. ft. of floor space, closed for more than 10 years. New owner will modernize for grinding, reduction and grading of garnet grains for abrasive purposes. Certain equipment will be removed from South Danbury mill and other machinery installed.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until May 23 for one centerless feed polishing machine for cylindrical work, with motor drive, taper feed unit, etc. (Circular 413).

Allen Mfg. Co., Sheldon Street, Hartford, Conn., hollow set screws, cap screws, pipe plugs, etc., has let general contract to S. S. Walker, 607 Main Street, for one-story addition, 40 x 45 ft., for expansion in steel-hardening department. Golden-Storrs & Co., Hartford, are architects.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 2 for 100 barrel type hand trucks (Schedule 6304) for Portsmouth, N. H., and Puget Sound, Wash., Navy yards.

SOUTHWEST

Aircraft Accessories Corp., 3732 San Fernando Road, Glendale, Cal., has acquired plant and business of Thomas L. Siebenthaler Mfg. Co., 410 West Sixth Street, Kansas City, Mo., manufacturer of kindred products, for Eastern branch plant. Expansion and improvements will be made, and additional equipment installed for manufacture of aircraft radio transmitters, receiving apparatus, etc.

Joplin Foundry Co., 527 East Seventh Street, Joplin, Mo., gray iron castings, has let general contract to Fred Briggs, 301 McConnell Street, for extensions and improvements. Cost close to $50,000 with equipment.

Callingwood Grain Co., Wiley Building, Hutchinson, Kan., has let general contract to Chalmers & Borton, 28 East First Street, for new 750,000-bu. grain elevator near Fair grounds. Cost close to $90,000 with elevating, conveying, screening and other equipment.

Steadley Co., Carthage, Mo., manufacturer of bed springs and other wire products, has let general contract to George Miller, Carthage, for one-story addition, 55 x 200 ft. Cost over $50,000 with equipment.

Storz Instrument Co., 4919 Forest Park Boulevard, St. Louis, precision instruments and parts, has leased two-story building at 240 South Boyle Avenue and will remodel for new plant for parts production and assembling.

Humble Oil & Refining Co., Humble Building, Houston, Tex., is considering addition to oil refinery at Baytown, Tex., for production of industrial alcohol. Cost over $175,000 with machinery.

C. & R. Oil Co., Houston, Tex., Ralph Smith, secretary and treasurer, has acquired property on Crosby Road, Burchfield industrial district, for new bulk oil storage and distributing plant, with steel storage tanks, pumping station and auxiliary structures. Cost close to $50,000 with equipment.

WESTERN PA. DIST.

Hygrade Sylvania Corp., Emporium, Pa., manufacturer of radio tubes, electric lamps, etc., has let general contract to Leslie R. Porter Co., 164 Stuart Street, Boston, for three-story addition. Cost about $160,000 with equipment. Main offices are at Salem, Mass. S. M. Brown, last noted address, is company engineer.

United States Engineer Office, Huntington, W. Va., asks bids until June 1 for six pumps for sewage service and nine pumps for storm water for Ceredo-Kenova, W. Va., flood protection project (Circular 297).

Pennsylvania Distilling Co., Logansport, Pa., is considering rebuilding seven-story storage and distributing building at local distillery, recently destroyed by fire. Loss over $750,000 with equipment.

BUFFALO DISTRICT

Marlin-Rockwell Corp., Chandler Street, Jamestown, N. Y., ball and roller bearings, etc., has let general contract to J. M. Benzinger, 121 West Fourth Street, for one-story addition, 25 x 170 ft. Cost over $50,000 with equipment. Beck & Tinkham, Bailey Building, are architects.

Quartermaster, Fort Niagara, N. Y., asks bids until May 22 for galvanized screen cloth, nails, pipe and fittings, electrical supplies, etc. (Circular 627-31).

Crucible Steel Co. of America, Inc., Syracuse, N. Y., has approved plans for expansion and modernization in local plants, including Halcomb Steel Co., State Fair Boulevard, where one-story addition will be built, and Sanderson Brothers Steel Works division, 104 Magnolia Street. Additional equipment will be installed. Work will be carried out during summer. Main offices are in New York.

SOUTH ATLANTIC

City Council, Elizabeth City, N. C., asks bids on general contract until May 23 for new municipal airport, including steel hangar, repair and reconditioning shops, oil and gasoline storage tanks and facilities, administration and service buildings and other work. Cost about $500,000.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until May 31 for one 50-ton diesel-electric traveling revolving jib crane for Charleston Navy Yard (Specifications 9193).

Tri-City Canada Bottling Co., Greensboro, N. C., has leased one-story building to be erected by J. Walter Lambeth on West Market Street for new mechanical-bottling works. Cost close to $45,000 with equipment. John H. Bonitz, 330 Bellemeade Street, is contractor; J. P. Coble, Security Bank Building, is architect.

SOUTH CENTRAL

United States Engineer Office, Vicksburg, Miss., asks bids until May 22 for two double-drum hoists (Circular 221), 5000 ft. of plow steel wire rope (Circular 220), 7000 lb. of welding electrodes and 5000 lb. of welding rods (Circular 219).

Cuban Coffee Co., 1616 Southern Avenue, Shreveport, La., plans one-story plant at Hoadley and Seymour Streets for mixing, blending, roasting, storage and distribution. Cost about $45,000 with equipment. It will replace a plant at first noted location recently destroyed by fire.

Hollingsworth & Whitney Co., 140 Federal Street, Boston, Mass., bond, kraft and other paper stocks, has let general contract to Rust Engineering Co., Clark Building, Pittsburgh, for new kraft pulp and paper mill at Mobile, Ala., where large tract of waterfront property was acquired a few months ago. Plant will include power house, machine shop and auxiliary mechanical structures for employment of about 1000 persons. Cost about $5,000,000.

MICHIGAN DISTRICT

Chrysler Corp., Detroit, has approved plans for expansion and improvements in branch plant at 5800 Eastern Avenue, Los Angeles, operated in name of Chrysler Motors of California, Inc., to include one-story addition, totaling over 16,000 sq. ft. of floor space, for increase in assembling division. Installation will include additional rust-proofing and finishing equipment. New shipping docks and other facilities will be provided. Cost over $175,000 with equipment.

Schust Baking Co., Saginaw, Mich., plans three-story addition, with installation of mixing machinery, traveling ovens, loaders, conveyors and other equipment. Cost over $100,000. Company is affiliated with Loose-Wiles Biscuit Co., Kansas City, Mo.

Norge Division, Borg-Warner Corp., 670 East Woodbridge Street, Detroit, electric refrigerators, air-conditioning and heating equipment, has removed service branch of last two noted divisions to works at Muskegon, Mich., where expansion will be carried out.

MIDDLE WEST

American Manganese Steel Co., 389 East Fourteenth Street, Chicago Heights, Ill., will take bids soon on general contract for one-story foundry addition. Cost over $50,000 with equipment. Benjamin F. Olson, 19 South LaSalle Street, Chicago, is architect.

Quaker Oats Co., 141 West Jackson Boulevard, Chicago, cereal products, has approved plans for expansion and improvements in branch mill at Akron, Ohio, including additional units for general production, grain storage and distribution. Cost about $500,000 with equipment.

Construction Service, Veterans' Administration, Washington, asks bids until June 13 for new boiler plant at institution at North Chicago, Ill., including boiler unit and auxiliary equipment.

Andrews Wire & Iron Works, 1802 Preston Street, Rockford, Ill., operated by Washburn Co., iron and steel specialties, has let general contract to Holm-Page Co., 2117 Kishwaukee Street, for one-story addition, 75 x 112 ft., for plating department. Cost close to $45,000 with equipment.

Board of Water and Light Trustees, Muscatine, Iowa, asks bids until May 31 for municipal electric power plant equipment, including 7500-kw. turbo-generator unit and accessories (Section 3), surface condenser for generator noted (Section 4) and auxiliary equipment. This is part of expansion and improvement program at station to cost about $500,000. Young & Stanley, Inc., Muscatine, is consulting engineer.

Bureau of Reclamation, Denver, asks bids until May 25 for 2,218,000 ft. of bare copper wire, 2,218,000 ft. of bare aluminum stranded cable, connectors, aluminum compression joints, tapered armor rod assemblies, 280,000 ft. of copper rod, 1,900,000 ft. of bare steel-reinforced aluminum stranded cable, 1,900,000 ft. of bare copper conductor, two portable hydraulic compressors and other accessory equipment (Proposal 44341-A).

Stokely Brothers & Co., Inc., 2002 South East Street, Indianapolis, food canner and packer, is considering rebuilding part of branch plant at Superior, Wis., comprising one and three-story units, recently destroyed by fire.

WASHINGTON DIST.

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for one 90-ft. self-supporting steel stack and breeching for naval proving grounds, Dahlgren, Va. (Specifications 9165).

Municipal Airport Department, Logan Field, Dundalk, Baltimore, plans one-story machine shop for seaplane maintenance and repairs; also new steel hangar with shop and reconditioning facilities. Appropriation of $475,000 has been arranged. This is part of $1,000,000 bond issue recently voted for expansion and improvements at airport, including new administration building and other structures. W. Watters Pagon, Lexington Building, is consulting engineer for city airport.

General Purchasing Officer, Panama Canal, Washington, asks bids until May 22 for two motor-driven portable saws, one motor-generator set, armored, copper, single-conductor and apparatus-type cable, bare copper wire, magnet wire, flexible wire cord, 156,000 ft. of rigid steel conduit, 400 conduit elbows, switches, electrical measuring instruments and other equipment (Schedule 3459); until May 24, gate, globe, angle, throttle and foot valves, galvanized malleable iron pipe fittings, galvanized pipe flanges, brass or bronze unions, malleable iron unions, steam hose couplings and other equipment (Schedule 3465).

Nolde Brothers Baking Co., 306 North Twenty-sixth Street, Richmond, Va., has let general contract to E. E. Weddle & Co., Board of Trade Building, Norfolk, Va., for one-story branch baking plant, 130 x 255 ft., at Hampton Boulevard and Twenty-fifth Street, Norfolk, with service, repair and garage building adjoining, for company motor trucks and cars. Cost about $100,000 with traveling ovens, mixers, loaders and other machinery. McCormick Co., Inc., 121 South Negley Street, Pittsburgh, is architect and engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 23 for one motor-driven tilting arbor saw (Schedule 6284), one motor-driven pipe and nipple threading machine (Schedule 6283) for Philadelphia Navy Yard; 12 slides, 12 carriages and 12 base rings of welded construction (Schedule 6294), two 300-hp. dual input, geared speed changers, and six flexible couplings (Schedule 6289) for Washington yard; clamps and punches (Schedule 6230), anchor shackles (Schedule 6244), axes, hammers, hatchets, picks, sledges, etc. (Schedule 6227), pressure lubricating guns and fittings (Schedule 6222) for Eastern and Western yards.

OHIO AND INDIANA

Cleveland Pneumatic Tool Co., 3734 East Seventy-eighth Street, Cleveland, has arranged for purchase of about 10-acre tract at San Fernando Road and Hollywood Way, Burbank, Cal., for new branch plant. Initial works will consist of three one-story structures, for general production, engineering service and offices respectively. Division will be installed for production of aircraft parts and equipment. Cost over $200,000 with machinery.

Harris-Seybold-Potter Co., 4510 East Seventy-first Street, Cleveland, printing machinery and parts, has asked bids on general contract for one-story addition to Seybold division plant at 819 Washington Street, Dayton, Ohio, and improvements in present works. Cost over $50,000 with equipment.

Contracting Officer, Materiel Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until May 22 for auger bits (Circular 1037), 500 fuel pressure signal switch adjustable contact assemblies, 500 fuel pressure signal housing grommets, and 150 fuel system signal lamp test switch plunger assemblies (Circular 1001), 1730 tail wheel axle plugs (Circular 1003), operating levers, locking studs, tank housing assemblies, tank latches, etc. (Circular 1017); until May 24, 100,000 corrosion-resisting steel cotter pins and about 2,800,000 steel cotter pins (Circular 1034), propeller hub assemblies (Circular 1035); until May 25, fuel pump coupling extension shafts, oil pressure gage line surge chambers, stem assemblies, by-pass and balanced relief fuel valves, valve screws, nuts, and other equipment (Circular 1005); until May 26, 32 one-ton, 18 two-ton and 23 three-ton spur gear chain hoists (Circular 1049).

Central Soya Co., Decatur, Ind., soy bean oil products, has let general contract to Indiana Engineering & Construction Co., Old First Bank Building, Fort Wayne, Ind., for one-story addition, 30 x 150 ft., for expansion in processing department. Cost about $45,000 with equipment. Another award recently was made to same company for one-story addition, 150 x 300 ft., for storage and distribution, to cost close to $75,000.

Board of Public Works, Rushville, Ind., will take bids soon for equipment for boiler department at municipal electric power plant, including combustion control apparatus, instruments, cooling tower, etc. This is part of expansion and improvements being carried out at plant to cost about $140,000. Bevington-Williams, Inc., Indiana-Pythian Building, Indianapolis, is consulting engineer.

PACIFIC COAST

Douglas Aircraft Co., 3000 Ocean Park Boulevard, Santa Monica, Cal., has asked bids on general contract for one-story addition, 200 x 250 ft., with mezzanine floor, 50 x 250 ft., for expansion in assembling division. Cost over $250,000 with equipment. Edward C. and Ellis W. Taylor, 803 West Third Street, Los Angeles, are architects.

Bureau of Reclamation, Denver, asks bids until May 24 for one 50-ton, motor-operated, overhead traveling crane for Grand Coulee power plant, Grand Coulee, Wash. (Specifications 1231-D).

Henry J. Kaiser Co., Latham Square Building, Oakland, Cal., building and engineering contractor, plans large cement mill in Permanente Canyon district, near Cupertino, Santa Clara County, Cal., to furnish cement for construction of Shasta power dam, Central Valley project of Government, for which award of about 5,800,000 bbl. of low-heat Portland cement is being secured. New mill will comprise several units, with packing, storage and distributing buildings, power house, machine shop and other structures. Cost about $3,500,000.

Centennial Flouring Mills Co., Spokane, Wash., has approved plans for a large flour mill on local site. Cost about $750,000 with machinery. Allis-Chalmers Mfg. Co., Milwaukee, is engineer for plant and will furnish certain mill machinery to an amount of about $150,000.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 26 for one motor-driven drill press (Schedule 6277) for East San Pedro, Cal., naval air station; pneumatic sandblast equipment (Schedule 6268) for Alameda, Cal., naval air station; oil-fired furnace and spare lining (Schedule 6297); until June 1, two motor-driven centrifugal circulating pumps (Schedule 6286) for Puget Sound Navy Yard; socket wrenches (Schedule 6279); until June 2, one motor-driven boring, drilling and milling machine and spare parts (Schedule 6295) for Mare Island yard.

Acting Administrator, Bonneville project, Department of Interior, Portland, asks bids until June 1 for control house, untanking building, oil house and control conduit installation at North Vancouver, Wash. (Circular 316).

FOREIGN

International Harvester Co. of Great Britain, Ltd., London, England, affiliated with International Harvester Co., Chicago, has approved plans for initial works on 32-acre tract in Wheatley Park district, Doncaster, England, comprising several large one-story units for employment of about 400 persons. Cost over $750,000 with machinery. Additional buildings will be constructed later.

Imperial Oil, Ltd., 56 Church Street, Toronto, Ont., has let contract to M. W. Kellogg Canadian Co., Ltd., 35 Van Horne Avenue, Montreal, for expansion in main oil refinery at Calgary, Alta., including new production units, with cracking division for gasoline manufacture. Additional steel storage tanks and other facilities will be installed, for which separate contracts will be made soon. Cost about $1,700,000 with equipment.

Canadian Associated Aircrafts, Ltd., 1050 Beaver Hall Hill, Montreal, plans new one-story works at Malton, about 250 x 375 ft., for parts production and assembling, bids to be asked in June for general erection. Cost over $175,000 with equipment. Pringle & Son, 485 McGill Street, Montreal, are architects and engineers.

CAST IRON PIPE

North Kingston, R. I., has started surveys for a water system to cost approximately $225,000. Jenks & Ballou, 2600 Independence Trust Building, Providence, R. I., are engineers.

Saugus, Mass., contemplates a water system. Fay, Spofford & Thorndike, 11 Beacon Street, Boston, are engineers. Edward Gibbs, Jr., is chairman of Board of Selectmen.

Fairhaven, Mass., has tentative plans for a water system. Water Department has engaged Frank A. Barbour, 1119 Tremont Building, Boston, to draw plans.

West Boylston, Mass., plans pipe line extensions in water system; also installation of steel standpipe, pumping machinery and other waterworks equipment. Cost over $135,000. Whitman & Howard, 89 Broad Street, Boston, are consulting engineers.

Fairhaven, Mass., plans pipe line extensions and replacements in water system. Surveys and estimates of cost are being made. F. A. Barbour, 73 Tremont Street, Boston, is consulting engineer.

Morristown, N. J., plans pipe line extensions in water system in Reynolds Avenue and other streets. Cost about $50,000.

General Purchasing Agent, Panama Canal, Washington, closes bids May 24 for 2400 ft. of 2-in. cast iron soil pipe, cast iron soil pipe fittings and other pipe fittings (Schedule 3465).

Board of Henrico County Supervisors, Richmond, Va., plans pipe lines for water system in Sanitary District No. 1, including 12-in. pressure line for main supply from Deep Run Creek, source of water, to distribution reservoir, about 11,000 ft. in all, and two 12-in. lines from reservoir to point in Sanitary District. Roswell D. Trimble, American Building, Richmond, is consulting engineer; Robert E. Horton, Voorheesville, N. Y., is hydraulic engineer.

Ravenna, Ohio, plans 1½-in. pipe for new line for auxiliary water service. Cost about $40,000. Department of Public Service is in charge.

Scooba, Miss., plans pipe lines for water system and other waterworks installation. Surveys and estimates of cost are nearing completion. Special election will be called soon to approve bond issue. John M. Fillan, Jackson, Miss., is consulting engineer.

Newport, Ky., will take bids soon for pipe line extensions in water system, including improvements in pumping station. Cost about $100,000. Fosdick & Hilmer, Union Trust Building, Cincinnati, are consulting engineers.

Westover Hills (Fort Worth), Tex., plans pipe lines for water system and other waterworks installation. A special election has been called to vote bonds for project.

Pine Lake, Ga., plans pipe lines for water system and other waterworks installation. Surveys and estimates of cost are being made. Special election will be called soon to vote bonds.

New Salem, N. D., plans pipe lines for water system and other waterworks installation. Fund of about $137,000 is being arranged through Federal aid for this and sewage system.

Stillwater, Okla., plans main pipe line from Lake Carl Blackwell to municipal filtration plant. Cost about $40,000.

Mesa, Ariz., has awarded 260 tons of 2, 4, and 6-in. pipe to United States Pipe & Foundry Co., San Francisco.

Long Beach, Cal., has awarded 400 tons, comprising 30,000 ft. of 6-in. and 5040 ft. of 4-in. pipe to United States Pipe & Foundry Co., San Francisco.

Glendale, Cal., has awarded 315 tons, comprising 2800 ft. of 20-in. and 1200 ft. of 12-in. pipe, to United States Pipe & Foundry Co., San Francisco.

Prescott, Ariz., has awarded 400 tons for Goldwater Dam flow line to Pacific States Cast Iron Pipe Co., Provo, Utah.

Spokane, Wash., asks bids May 18 on 185 tons 6-in. pipe.

Burbank, Cal., has opened bids on 15,000 ft. of 4, 6, 8, and 10-in. pipe.

. . . GREAT BRITAIN . . .

. . . *High steel production expected for some months.*

LONDON, May 16 (*By Cable*)—United Kingdom steel output in April was affected by Easter holidays, but was still over 1,000,000 tons, and indications point to high production for several months. Commercial consumers, now realizing that price reductions after June are unlikely, are placing forward orders, though makers are insisting on extended delivery dates.

First arrivals of Australian semi-finished steel are expected shortly, while further quantities have been purchased from the Continent. Scandinavia is buying hematite. Turkey bought 300 railway cars valued at about £500,000.

Continental steel production is increasing to meet the growing demands of major powers. Baltic countries, Sweden, the Far East, and South America have placed good orders.

The Thin Sheet Cartel reaffirmed prices. France rejoined the International Wire Export Cartel.

There is strong demand for tin plate with export orders up to the end of the year. No mills are selling at the official minimum. Quotations go as high as 21s. 6d. f.o.b. Unfilled orders amount to over 5,000,000 base boxes and more mills are restarting.

Black and galvanized sheet makers will be fully occupied for several months on air raid shelters.

United Kingdom imports of all kinds in April amounted to 91,000 tons, of which 3700 tons was from the United States. Scrap imports amounted to 21,000 tons.

Exports of all kinds totaled 146,000 tons of which 6000 tons was pig iron; black sheets, 7000 tons; galvanized sheets, 13,000 tons; tin plate, 26,000 tons.

Changes in British prices, effective July 1, have been announced as follows: Hematite pig iron reduced 5s.; Siemens-Martin acid billets other than silicomanganese increased 5s. and products rolled from these increased 6s. All other prices unchanged.

$1,454,700 Generator Order For Westinghouse

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, received an order for two additional generators for the Boulder Dam power plant which will cost $1,454,700.

. . . PIPE LINES . . .

Shell Pipe Line Corp., Shell Building, St. Louis, affiliated with Shell Petroleum Corp., same address, is contemplating surveys and plans for new 6-in. welded steel pipe line from Bennett and Denver oil field districts, Yoakum County, Tex., to Hobbs, N. M., about 35 miles, for crude oil transmission. Connection will be made with main trunk line of company at latter place. Cost over $200,000 with booster pumping stations and other operating facilities.

Metropolitan Utilities District, Seventeenth and Harney Streets, Omaha, Neb., plans pipe lines for high-pressure gas transmission and distribution in South Omaha area. Cost over $85,000. T. A. Leisen is chief engineer.

Warden, Federal Correction Institution, LaTuna, Tex., asks bids until May 22 for 750 ft. of steel pipe; also for gas pressure regulators, gas stops, gas meters, etc. (Circular 1727).

Socony-Vacuum Oil Co., 26 Broadway, New York, has awarded contracts for new 10-in. welded steel pipe line from Woodriver, Madison County, Ill., to Lima, Ohio, including branch line connecting with recently developed oil field in Illinois basin, about 360 miles, total, for crude oil transmission, dividing work as follows: Eastern section to T. R. Jones, Inc., Magnolia Building, Dallas, Tex.; central section to Shehan Construction Co., Tulsa, Okla.; and Western section to Whittiker Construction Co., Fort Worth, Tex. Cost over $3,500,000 with booster pumping stations and other operating facilities.

American-Michigan Pipe Line Co., Mount Pleasant, Mich., plans welded steel pipe line extensions for natural gas transmission from gas area in Walker and Wyoming Townships, Mich., to Grand Rapids, Mich. Company is a subsidiary of Michigan Consolidated Gas Co., 415 Clifford Street, Detroit, which has filed petition with State Public Service Commission for permission to transport gas between points noted.

Humble Pipe Line Co., Humble Building, Houston, Tex., affiliated with Humble Oil & Refining Co., same addresses, has begun construction with company forces of new 4-in. welded steel pipe line from Woodson oil field, Throckmorton County, Tex., to connection with pumping station near Albany, Tex., about 25 miles, where line will make intersection with main oil transmission line of company to Gulf Coast. Cost close to $150,000.

Billings Gas Co., Billings, Mont., plans steel pipe line extensions in gas distribution system in Bridger and Fromberg districts, including replacements in certain existing lines. Cost about $90,000. J. E. Moore is manager.

. . . CANADA . . .

. . . *British orders supporting steel production*

TORONTO, May 16—Dominion Steel & Coal Corp., Sydney, N. S., is making larger shipments of steel to Britain and it is stated that two steamers will be kept busy throughout the summer delivering semi-finished. It also is stated that a new order has been received for rods, bars and tie plates which will keep the mill busy during the summer, but actual tonnage involved is not reported. The Sydney works has reached the highest production in over two years, now having in operation 10 open hearths, two mixer furnaces, one electric furnace and two blast furnaces. With the exception of the rail mill, all mills at Sydney are running three shifts daily.

BUILT BY MORGAN *Engineering*

FOR STRIPPING INGOTS—BIG-END-UP OR STANDARD

• Illustrated is a Morgan 200-ton, 55'-0" span, Universal Screw Type Ingot Stripper at work stripping hot top big-end-up ingots. This same machine will also strip standard or small-end-up ingots without any change in the mechanism. With this arrangement it is possible to strip a mixed heat without any lost time. Efficient, rugged, dependable—such machines play an important part in stepping up steel production.

For full particulars regarding this type of stripper, please ask for Bulletin No. 30-A.

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THE MORGAN ENGINEERING CO., Alliance, Ohio

Pittsburgh, 1420 Oliver Building

THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

. . . Better diversification in buying seen in the East . . . Chicago district sales drop off . . . Foreign business has slight edge over domestic volume . . . Better automotive buying activity.

Foreign Buying Has Edge Over Domestic Ordering

CINCINNATI—The local machine tool market is quiet, demand having leveled off at the rate that has prevailed for about three weeks. Currently a small improvement of domestic business is noted with some plants reporting an equal division between home and foreign shipping instructions. On the whole, however, export business is still shading other demand with the indication that a substantial portion is for rearmament purposes. Lathes and millers are still out in front but other types, except drills, are not far behind in consumer interest. Lathe orders included several multiple units, but the bulk of business was for one or two units. Production is unchanged.

Cleveland Builders Report Automotive Buying

CLEVELAND—Market circles hear that recent sales include 10 single spindle hobbers for an automotive manufacturer and threading equipment for Great Britain for shells.

Chevrolet appears to have been more active recently than other divisions of the automotive industry. Several parts makers have ordered single machines, including one plant at Marshall, Mich. Bids on the Drayer plant at Detroit were the highlight of the used machinery market during the past week. Offers of around $20,000 and $22,000 proved too low for this equipment, indicating that the high bid was somewhere in the neighborhood of $24,000.

Vlcheck Tool Co. here plans to spend about $100,000 on a new plastics molding division.

Buying Pace Slackens In Chicago Area

CHICAGO — Little new business has come into this market in the past week. The Illinois Central list of some dozen items, which was reported in the last issue of THE IRON AGE, has not yet been acted upon, but bids closed early this week. In the past seven days Chicago sellers have noticed a slackening, for which there is no apparent reason. Since the first of the year one large seller of used machinery has enjoyed business, which if continued over a year's period, would be satisfactory. Unfortunately, however, it has not been sufficient to balance the periods of depression which usually come throughout a 12-month period, and, in addition, a considerable portion of the bookings were from abroad. This particular company, therefore, and many other vendors of used and new machine tools, who sell extensively for export, will be in a difficult situation when foreign demand abates, unless in the meantime, domestic interest has increased far beyond its present status.

Better Diversification Seen In Eastern Buying

NEW YORK—Some sellers are commenting upon the better diversification of buying that has taken place in the last week or two. Some machine tools have been bought by concerns that have not been in the market for several years or on quotations originally made that long ago. There have been instances, on the other hand, of the inquiry and the order coming through in the same day. Nonmetal working plants are listed among recent purchasers of lathes. Generally, however, the principal buyers are still the aircraft engine and parts manufacturers, and they constitute the entire source of one seller who reports a satisfactory total volume. The future is somewhat uncertain, but present indications point to a month's volume of sales closely equal to that of April.

Shift in Buick Production Presages Machinery Buying

DETROIT—The decision to move production of the Buick-Oldsmobile automatic transmission from the Buick plant at Flint to one of the old Fisher plants on Theodore Street in Detroit has uncovered what appears to be this year's only major program for the buying of machine tools. Design changes are understood to have been made to simplify the transmission so it appears that some new equipment must be bought, although much probably will be moved from Flint to Detroit. Also it has been learned that minor changes are being made in the Buick rear axle. Definite acceptance of leaf spring seats by one major auto company is believed finally to have been made, so F. L. Jacobs Co., the supplier, is expected to proceed on tooling plans shortly. Magnesium Fabricators, Inc., at Adrian, Mich., is reported planning to increase foundry capacity to three or four times the present tonnage. The firm is a new one which has been successful in capturing a great deal of aircraft business in recent months.

Machine Tool Index Declines in April

CLEVELAND—Declines in both domestic and foreign orders forced the April index figure of the National Machine Tool Builders Association down 16 per cent to 155.6 against 185.4 for March. However, the index remained considerably ahead of April 1938 when total orders averaged 90.3. The three months' average trend at the conclusion of April is 169.4, slightly over the March figure of 167.8 and well ahead of the average at the end of April 1938, which was 91.0.

Vlchek Tool Co. Enters Plastics Business

CLEVELAND—Vlchek Tool Co. will enter the plastics business. The company, which produces forged tools, plans to spend approximately $100,000 on new machinery and other plastics equipment, which will make its East 87th Street plant the largest plastics molding plant in this city. A. C. Fulton will be general manager of the new division. Frank J. Vlchek is president of the company.

Machine Tool Builders Issue 32-Page Booklet

CLEVELAND — The National Machine Tool Builders' Association has issued an illustrated booklet of 32 pages, titled "Machine Tools and You."

The text for this economic presentation of the machine tool industry is built around an address given to the Army Industrial College at Washington, by Howard W. Dunbar, past president of the association, who is vice-president and general manager of the grinding machinery division of the Norton Co.

After pointing out how it would be impossible commercially to produce most everyday necessities and luxuries without machine tools, the booklet defines and discusses the five basic arts, the scope of the industry and its plants, management and personnel. Life of machine tools, development of new designs, methods of manufacture and sales problems, are other points taken up.

Twenty-six photographs and several charts illustrate the text. Copies are being sent to libraries, newspaper executives and legislators, and made otherwise available.

What Design Engineers are doing with Silverlink Roller Chain!

NEW RUG PRINTING INVENTION

an interesting application
of Silverlink Roller Chain

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Link-Belt Company, Indianapolis, Chicago, Philadelphia, Atlanta, San Francisco, Toronto. Offices and distributors located in principal cities. 7648

Costs Reduced with Silverlink Roller Chain

Because they developed their honing and reaming machine with Silverlink Roller Chain as the internal transmission instead of a series of gears, the Automotive Maintenance Machinery Co., North Chicago, Illinois, were able to cut costs and keep their selling price advantageously low.

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The Meaker Company, Chicago, design and build automatic plating and processing equipment for a wide variety of industries. They are constantly developing new applications of roller chain to meet unusual conditions of service and production. The installation illustrated is in a plumbing fixture plant and shows their Return-type, Full Automatic Metal Plating Unit in which Silverlink Roller Chain is used.

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Silverlink ROLLER CHAIN

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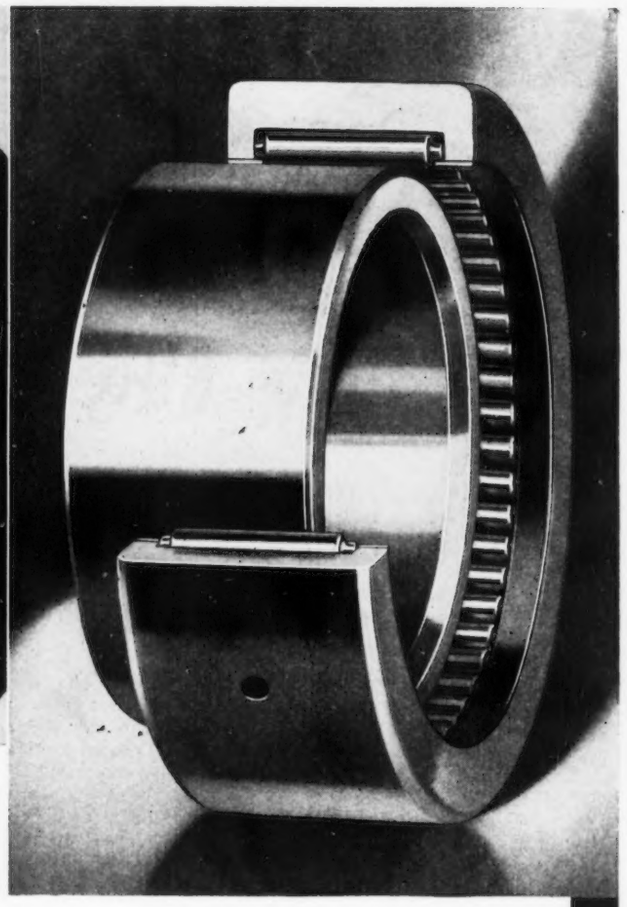

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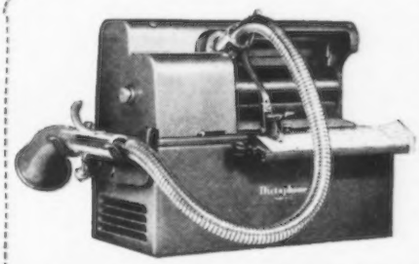

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In this issue!

Don't fail to read Mr. J. H. Van Deventer's editorial on page 63

Here's a NEW and BETTER slushing compound–

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THERE is now available to you an improved material to protect highly finished surfaces of steel and non-ferrous metal products against corrosion — GULF OILCOAT NO. 1. This product is an entirely new type of slushing compound, developed by Gulf technologists after many years of research and field tests.

While GULF OILCOAT NO. 1 provides a thin film which is not easily rubbed off by handling, it may be readily removed by conventional solvents. Accelerated laboratory corrosion tests, as well as field tests with all types of metals, have established the superiority of this new type of slushing material over products formerly used for this purpose.

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WHO MAKES IT

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Norton Co., Worcester, Mass.

ABRASIVE WHEELS — See Grinding Wheels

ABRASIVES—Steel Shot and Grit
Harrison Abrasive Corp., Manchester, N. H.
Pangborn Corporation, Hagerstown, Md.
Pittsburgh (Pa.) Crushed Steel Co.
Steel Shot & Grit Co., Boston, Mass.

ACCESSORIES—Welding
Lincoln Electric Co., The, Cleveland.

ACCUMULATORS—Hydraulic
Baldwin-Southwark Corp., Southwark Div., Philadelphia.
Lake Erie Engineering Corp., 68 Kenmore Sta., Buffalo, N. Y.
Watson-Stillman Co., The, 103 Aldene Road, Roselle, N. J.

ACETYLENE—Dissolved in Cylinders & Small Tanks
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

ACIDS—Pickling
American Chemical Paint Co., Ambler, Pa.

ALLOYS—Copper
American Brass Co., The, Waterbury, Conn.
Mallory, P. R., & Co., Inc., Indianapolis, Ind.

ALLOYS—Ferro
Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

ALLOYS—Magnesium
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

ALLOYS—Tungsten
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

ALLOYS—Vanadium
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

ALLOYS—Zinc Base Die Casting
New Jersey Zinc Co., The, 160 Front St., N. Y. C.

ALUMINUM
Aluminum Co. of America, Pittsburgh.

AMMETERS & VOLTMETERS
General Electric Co., Schenectady, N. Y.
Weston Electrical Instrument Corp., Newark, N. J.

AMMETERS AND VOLTMETERS—Recording
Leeds & Northrup Co., 4956 Stenton Ave., Philadelphia.

AMMONIA RECOVEPY PLANTS
Koppers Co., Engineering & Construction Div., Pittsburgh.

ANGLES, BEAMS, CHANNELS AND TEES
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Inland Steel Co., Chicago.
Jones & Laughlin Steel Corp., Pittsburgh
Ryerson, Jos. T., & Son, Inc., Chicago.
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.
Steel & Tubes, Inc., Cleveland.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

ANGLES, BEAMS, CHANNELS & TEES —Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

ANNEALING—See Heat Treating

ANNEALING BOXES
Pittsburgh (Pa.) Annealing Box Co.
United Engineering & Fdry. Co., Ptgh.

ANNEALING COVERS
Pittsburgh (Pa.) Annealing Box Co.

ANODES—Lead
National Lead Co., 111 Bdway., N. Y. C.

APPAREL—Welding
Lincoln Electric Co., The, Cleveland.

ARBORS
Cincinnati (Ohio) Milling Mch. Co., The
Morse Twist Drill & Mch. Co., New Bedford, Mass.

ARMORING MACHINERY—Cable, Wire, Hose
Sleeper & Hartley, Inc., Worcester, Mass.

ARRESTERS—Spark
Harrington & King Perforating Co., Chicago

ASBESTOS
Carey, Philip, Co., The, Cincinnati, Ohio.
Johns-Manville Corp., 22 East 40th St., N. Y. C.

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Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

BABBITT METALS
Bunting Brass & Bronze Co., The, Toledo, Ohio
Cadman, A. W., Mfg. Co., Pittsburgh.
Cramp Brass & Iron Foundries Co., Philadelphia.
Gardiner Metal Co., 1881 S. Campbell Ave., Chicago
National Lead Co., 111 Bdway., N. Y. C.

BALANCING MACHINES — Static Dynamic
Gisholt Machine Co., Madison, Wis.

BALING PRESSES—Scrap — See Presses —Baling

BALLS—Burnishing
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Hartford (Conn.) Steel Ball Co., The.

BALLS—Steel, Brass or Bronze
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SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.

BANDS—Steel
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

BARRELS—Burnishing
Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.

BARRELS—Tumbling
Baird Mch. Co., The, Bridgeport, Conn.
Hartford (Conn.) Steel Ball Co., The.
Whiting Corp., Harvey, Ill.

BARS—Alloy
Midvale Co., The, Nicetown, Phila., Pa.
Republic Steel Corp., Cleveland, Ohio.

BARS—Aluminum
Aluminum Co. of America, Pittsburgh.

BARS—Brass, Bronze or Copper
Bunting Brass & Bronze Co., Toledo, Ohio.
Johnson Bronze Co., 505 So. Mill St., New Castle, Pa.

BARS—Cold Drawn
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland
Bliss & Laughlin, Inc., Harvey, Ill.; Buffalo, N. Y.
Jones & Laughlin Steel Corp., Pittsburgh.
Union Drawn Steel Div., Republic Steel Corp., Massillon, Ohio.

BARS—Concrete, Reinforcing
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Laclede Steel Co., St. Louis, Mo.
Nicetown Plate Washer Co., Inc., Philadelphia.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

BARS—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

BARS—Rustless
Midvale Co., The, Nicetown, Phila., Pa.
Rustless Iron & Steel Corp., Baltimore, Md.

BARS—Steel
Bethlehem (Pa.) Steel Company.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Great Lakes Steel Corp., Ecorse, Detroit
Inland Steel Co., Chicago.
LaSalle Steel Co., Chicago.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos. T., & Son, Inc., Chicago.
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.
Steel & Tubes, Inc., Cleveland.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.
Youngstown (Ohio) Sheet & Tube Co., The.

BATTERIES—Storage
Electric Storage Battery Co., The, Phila.

BATTERY CHARGERS
Cutler-Hammer, Inc., Milwaukee.

BEAMS—See Angles, Beams, Channels and Tees

BEARINGS—Babbitt
Bunting Brass & Bronze Co., The, Toledo, Ohio
Cadman, A. W., Mfg. Co., Pittsburgh.
Johnson Bronze Co., 505 So. Mill St., New Castle, Pa.

BEARINGS—Ball
Bantam Bearings Corp., The, South Bend, Ind.
Bearings Co. of America, Lancaster, Pa.
Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.
New Departure Div., General Motors Corp., Bristol, Conn.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Schatz Mfg. Co., Poughkeepsie, N. Y.

BEARINGS, Brass and Bronze
Ampco Metal, Inc., Milwaukee, Wisc.
Bunting Brass & Bronze Co., Toledo, O.
Johnson Bronze Co., 505 So. Mill St., New Castle, Pa.
National Bearing Metals Corp., Pittsburgh.
Shenango-Penn Mold Co., Dover, Ohio.

BEARINGS—Oilless
Bunting Brass & Bronze Co., Toledo, O.
Rhoades, R. W., Metaline Co., Inc., Long Island City, N. Y.

BEARINGS—Quill
Bantam Bearings Corp., The, South Bend, Ind.

BEARINGS—Radial
Bantam Bearings Corp., The, South Bend, Ind.
Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.
Hyatt Bearings Div. General Motors Corp., Newark, N. J.
New Departure Div., General Motors Corp. Bristol, Conn.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.

BEARINGS—Roll Neck
Bantam Bearings Corp., The, South Bend, Ind.
Morgan Construction Co., Worcester, Mass.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Roller
Bantam Bearings Corp., The, South Bend, Ind.
Hyatt Bearings Div. General Motors Corp., Newark, N. J.
Link-Belt Co., 519 North Holmes Ave., Indianapolis, Ind.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Roller Tapered
Bantam Bearings Corp., The, South Bend, Ind.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Rolling Mill Equipment
Bantam Bearings Corp., The, South Bend, Ind.
Morgan Construction Co., Worcester, Mass.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Shaft Hanger
Hyatt Bearings Div. General Motors Corp., Newark, N. J.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.

BEARINGS—Thrust
Bantam Bearings Corp., The, South Bend, Ind.
Bearings Co. of America, Lancaster, Pa.
Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.
Hyatt Bearings Div. General Motors Corp., Newark, N. J.
New Departure Div., General Motors Corp., Bristol, Conn.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
Timken Roller Bearing Co., The, Canton, O.

BELT—Conveyor, Elevator
Goodrich, B. F., Co., The, Akron, Ohio
Hewitt Rubber Corp., Buffalo, N. Y.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

BELTING—Leather
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

BELTING—Metal, Conveyor, High and Low Temperature
Wickwire Spencer Steel Co., 500 Fifth Ave., N. Y. C.

BELTING—Rubber
Goodrich, B. F., Co., The, Akron, Ohio
Hewitt Rubber Corp., Buffalo, N. Y.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

BELTS—V-Type
Allis-Chalmers Mfg. Co., Milwaukee.
Goodrich, B. F., Co., The, Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

BENCH LEGS—Steel
New Britain-Gridley Machine Div., The New Britain Machine Co., New Britain, Conn.

BENDING MACHINES—Hand, Band and Angle
Excelsior Tool & Mch. Co., E. St. Louis, Ill.

BENDING MACHINES—Hand and Power
Buffalo (N. Y.) Forge Co., 492 Broadway
Cincinnati (Ohio) Shaper Co., The.
Niagara Machine & Tool Works, Buffalo, N. Y.

BENZOL RECOVERY PLANTS
Koppers Co., Engineering & Construction Div., Pittsburgh.

BERYLLIUM COPPER
American Brass Co., The, Waterbury, Conn.

BEZELS & ESCUTCHEONS
Grammes, L. F., & Sons, Inc., Allentown, Pa.

BILLETS—Alloy
Harrisburg (Pa.) Steel Corp.
Midvale Co., The, Nicetown, Phila., Pa.

BILLETS—Alloy Steel
Andrews Steel Co., The, Newport, Ky.

BILLETS—Carbon
Harrisburg (Pa.) Steel Corp.

BILLETS—Carbon Steel
Andrews Steel Co., The, Newport, Ky.

BILLETS—Chrome Nickel Steel
Rustless Iron & Steel Corp., Baltimore, Md.

BILLETS—Chrome Steel
Rustless Iron & Steel Corp., Baltimore, Md.

BILLETS—Forging
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., The, Newport, Ky.
Harrisburg (Pa.) Steel Corp.
Republic Steel Corp., Cleveland, Ohio.

PRODUCTS INDEX

BILLETS—Re-rolling
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., The, Newport, Ky.

BILLETS—Steel
Bethelhem (Pa.) Steel Company.
Continental Steel Corp., Kokomo, Ind.
Harrisburg (Pa.) Steel Corp.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

BLANKS—Chisel
Cleveland Steel Tool Co., The, 660 E. 82nd St., Cleveland, Ohio.

BLANKS—Gear and Pinion
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

BLANKS—Gear, Silent Steel
Waldron, John, Corp., New Brunswick, N. J.

BLAST CLEANING EQUIPMENT
American Foundry Equipment Co., The, 510 S. Byrkit St., Mishawaka, Ind.
Pangborn Corporation, Hagerstown, Md.

BLAST FURNACES
Brassert, H. A., & Co., Chicago, Ill.

BLAST GATES
Rockwell, W. S., Co., 50 Church St., N.Y.C.
R-S Products Corporation, Phila., Pa.

BLOCKS—Chain
Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

BLOWERS
Buffalo (N. Y.) Forge Co., 492 Broadway.

BLOWPIPES—Oxy-Acetylene Welding & Cutting
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

BOILERS—Waste Heat
Babcock & Wilcox Co., The, 85 Liberty St., N. Y. C.

BOILERS—Water Tube
Babcock & Wilcox Co., The, 85 Liberty St., N. Y. C.

BOLT CUTTERS
Landis Mch. Co., Inc., Waynesboro, Pa.
National Machinery Co., Tiffin, Ohio.

BOLT AND NUT MACHINERY
Acme Machinery Co., The, Cleveland.
Ajax Mfg. Co., The, Cleveland, Ohio.
Landis Machine Co., Inc., Waynesboro, Pa.
National Machinery Co., Tiffin, Ohio.
Waterbury (Ct.) Farrel Fdry. & Mch. Co., The.

BOLT POINTING MACHINES
Acme Machinery Co., The, Cleveland.

BOLT & RIVET CLIPPERS
Helwig Mfg. Co., St. Paul, Minn.

BOLTS—Carriage and Machine
Cleveland (Ohio) Cap Screw Co., The.
Lamson & Sessions Co., The, Cleveland.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Triplex Screw Co., Cleveland.

BOLTS—Special
Lamson & Sessions Co., The, Cleveland.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

BOLTS—Special, Hot or Cold Upset
Lamson & Sessions Co., The, Cleveland.

BOLTS—Stove
Lamson & Sessions Co., The, Cleveland.
Progressive Mfg. Co., Torrington, Conn.

BOLTS—Stove, Reeessed Head
American Screw Co., Providence, R. I.

BOLTS—Track
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

BOLTS AND NUTS
American Screw Co., Providence, R. I.
Clark Bros. Bolt Co., Millidale, Conn.
Lamson & Sessions Co., The, Cleveland.
Republic Steel Corp., Cleveland, Ohio.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Triplex Screw Co., Cleveland.

BOLTS AND NUTS—Self Locking
Lamson & Sessions Co., The, Cleveland.

BOND—Grinding Wheel
Bakelite Corp., 247 Park Ave., New York City.

BORING BARS
Bullard Co., The, Bridgeport, Conn.

BORING, DRILLING & MILLING MACHINES—Horizontal
Hill-Clarke Mchry. Co., 647 W. Washington Blvd., Chicago.
Lucas Machine Tool Co., Cleveland.

BORING & DRILLING MACHINES—Vertical
Baker Bros., Inc., Toledo, Ohio.
Bullard Co., The, Bridgeport, Conn.

BORING MACHINES—Diamond & Carbide Tools
Heald Machine Co., Worcester, Mass.

BORING MACHINES—Jig
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

BORING MACHINES—Precision
Cimatool Co., The, Dayton, Ohio.

BORING & TURNING MILLS—Vertical
Bullard Co., The, Bridgeport, Conn.
Cincinnati (Ohio) Planer Co.

BRAKE LINING AND BLOCKS—Asbestos
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

BRAKES—Electric
Clark Controller Co., The, Cleveland.
Cutler-Hammer, Inc., Milwaukee.
Electric Controller & Mfg. Co., The, Cleveland.
Kiekhaefer Corp., Cedarburg, Wisc.

BRAKES—Electric & Mechanical
Clark Controller Co., The, Cleveland.
Electric Controller & Mfg. Co., The, Cleveland.

BRAKES—Magnetic
Kiekhaefer Corp., Cedarburg, Wisc.
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

BRAKES—Metal Forming
Bryant Machinery & Engineering Co., Chicago.
Cincinnati (Ohio) Shaper Co., The.
Cleveland Crane & Engineering Co., The Steelweld Machinery Div., Wickliffe, Ohio.
Drels & Krump Mfg. Co., Chicago.
Ferracute Machine Co., Bridgeton, N. J.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.

BRICK—Fire Clay
Carborundum Co., The, Niagara Falls, N. Y.
Illinois Clay Products Co., Joliet, Ill.

BRICK—Insulating
Babcock & Wilcox Co., The, 85 Liberty St., N. Y. C.

BRIDGE BUILDERS
American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Belmont Iron Works, Philadelphia.

BRIDGE OPERATING MACHINERY—Movable
Earle Gear & Mch. Co., Philadelphia.

BRIQUETS—Ferroalloy
Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

BROACHES
Colonial Broach Co., Detroit.

BROACHING MACHINES
Bullard Co., The, Bridgeport, Conn.
Cincinnati (Ohio) Milling Mch. Co., The.
Colonial Broach Co., Detroit.
Lucas Machine Tool Co., Cleveland.
Oilgear Co., The, 1311 W. Bruce St., Milwaukee.

BRONZE FOR DIES
Ampco Metal, Inc., Milwaukee, Wisc.

BRONZE—Phosphor
Bunting Brass & Bronze Co., Toledo, Ohio.

BRUSHES—Machine
Pittsburgh Plate Glass Co., Brush Div., Baltimore, Md.

BRUSHES—Wire
Pittsburgh Plate Glass Co., Brush Div., Baltimore, Md.

BUCKETS—Clamshell
Blaw-Knox Div. of Blaw-Knox Co., Pittsburgh, Pa.
Cullen-Friestedt Co., 1303 S. Kilbourn Ave., Chicago.
Hayward Co., The, 50 Church St., N. Y. C.
Industrial Brownhoist Corp., Bay City, Mich.
Wellman Engineering Co., The, Cleveland

BUCKETS—Electric Motor
Hayward Co., The, 50 Church St., N. Y. C.

BUCKETS—Orange Peel
Hayward Co., The, 50 Church St., N. Y. C.

BUFFERS & POLISHING MACHINES
Packer Machine Co., The, Meriden, Conn.

BUFFING APPLICATORS—Automatic
Packer Machine Co., The, Meriden, Conn.

BUFFING COMPOUND
Harrison & Co., Haverhill, Mass.

BUILDINGS—Steel
American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
American Rolling Mill Co., Middletown, Ohio.
Belmont Iron Works, Philadelphia.
Blaw-Knox Div. of Blaw-Knox Co., Pittsburgh, Pa.
Iron & Steel Products, Inc., Chicago.

BULLDOZERS
Ajax Mfg. Co., The, Cleveland, Ohio.
Cleveland Crane & Engineering Co., The Steelweld Machinery Div., Wickliffe, Ohio.

BURNISHING MACHINES—Gear
Cimatool Co., The, Dayton, Ohio.

BURRING MACHINES
Acme Machinery Co., The, Cleveland.
Cimatool Co., The, Dayton, Ohio.

BUSHINGS—Bronze
Ampco Metal, Inc., Milwaukee, Wisc.
Bunting Brass & Bronze Co., Toledo, O.
Johnson Bronze Co., 505 So. Mill St., New Castle, Pa.
Shenango-Penn Mold Co., Dover, Ohio.

BUSHINGS—Oilless
Rhoades, R. W., Metaline Co., Inc., Long Island City, N. Y.

BUSHINGS—Phosphor Bronze
Bunting Brass & Bronze Co., Toledo, Ohio.

BY-PRODUCTS COKE AND GAS PLANTS
Koppers Co., Engineering & Construction Div., Pittsburgh.

CABLE—Electric
General Electric Co., Schenectady, N. Y.
Lincoln Electric Co., The, Cleveland.

CABLEWAYS AND TRAMWAYS—See Tramways

CALCIUM METAL & ALLOYS
Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

JUST BETWEEN US TWO

Flash!

A covey of your favorite family journal's editors traipsed through the lawn party being held just across the river, and on page 81 they give you the lowdown.

So far all we have seen of it is the preview of the General Electric exhibit. What impressed us most is Steinmetz Hall, where they make lightning. It's a vast, eerie chamber, dimly lighted, like a Frankenstein movie set. The announcer, who is hidden somewhere in the works, arouses your fears by insisting there is nothing to worry about, although he seems a little scared himself.

The current begins to build up, and with it the suspense. Just when we had bitten our finger-nail down to the first joint, a fuse popped. We expected Boris Karloff to stalk upon the scene, but instead, two engineers, who looked about a foot high, appeared and gingerly approached the mechanism. They looked as if they would much rather be in a dentist's chair having an impacted wisdom tooth extracted, and our heart bled for them, thinking how we feel when we change a 15-amp. fuse without pulling the switch, so we won't have to re-set the electric clocks.

Finally they got the fuse changed, and the announcer's build-up and the current build-up began again—when *c-r-a-s-h*—a blinding, deafening jagged flash leaped from a ball suspended in the air down to a miniature trylon. "Artificial lightning" is a gross understatement. It is the real thing, only harder on the ears.

Short Day for Grace

Something we surely want to see is the machine in the Polish Building that announces the exact time whenever you pick up a telephone set in front of it. According to the *New York Times*, Grace Moore made the recordings—"270 separate announcements, one for each minute of the day."

As the parrot said in the story, "What a hell of a short day!"

Sentiment

All over the country names of famous highways are being dropped and numbers are being substituted. This is too bad, for there is romance in "White Horse Pike," but "Route 28" is merely where you made 125 miles in two hours flat.

Setting himself against the trend, Robert Moses, New York City's park commissioner, refuses to drop the names of New York's highways and give 'em numbers temporarily for the guidance of Fair visitors. Two rousing cheers for this Moses who will lead us away from the cold impersonality of numbers and back to the warm friendliness of names!

Time was when even every factory had a name. Now it's "Plant 'C'," or "Building No. 4," which is bad business. How can you work up any enthusiasm toward building up a production record or a safety record for good old Factory No. 7? Blast furnaces, bless them, have resisted the trend. There are still Carries, Isabellas, Lucys, Marys, Bettys, Madelines, Harriets, Annas, Graces, Jeanettes, and Elizas.

And motor trucks, we are glad to see, are throwing off the thraldom of digits and are getting honest names. One we saw on West Street the other day even had two names. "Daisy Belle" was gold-lettered over the cab and "Billie" on the hood. It wasn't a mail truck and got away before we could investigate. The trucks with names seem to be better cared for than the others. So maybe, as Mother's Day promoters discovered years ago, sentiment has a cash value.

Street-Straddling

Speaking of English addresses, Henry Leonard wants to know how it is that some places in England have odd and even numbers on the same side of the street. A letter came in the other day from a firm at 167-168 Fleet Street, London. This system of numbering must be no end bewildering and we wonder that they put up with it.

Puzzles

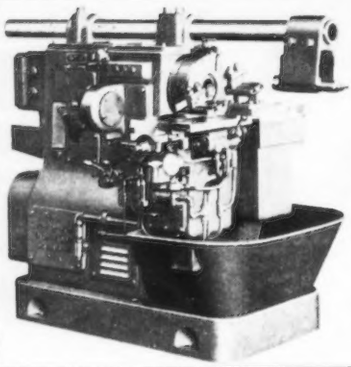
C. B. Fisher, manager of O. A. Norlund Co., Williamsport, Pa. (ice creepers, fish gaffs and poultry skewers), says he is "almost convinced that the estimation of eighteen readers of this column may perhaps be an understatement." Always a sucker for unqualified praise, we are blushing a deep scarlet.

This antidote for that which knits up the ravelled sleeve of care is sent in by Mr. Fisher. He says it is easy.

> *A square field is fenced with a board fence four boards high the boards are 11 ft. long. The total acres in the field equal the number of boards in the fence. How many acres in the field?*

—A.H.D.

BARDONS & OLIVER



ROTARY SPINDLE TYPE

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INFORMATION ON REQUEST

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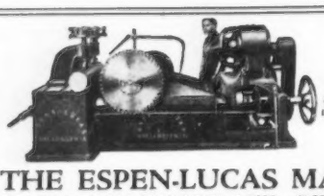

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17 STYLES AND SIZES
MERRELL
PIPE THREADING for BETTER threads MACHINES
TOLEDO, OHIO

In this issue - - -

Don't fail to read Mr. J. H. Van Deventer's editorial on page 63

PRODUCTS INDEX

CARBIC
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

CARBIDE
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

CARBIDE—Boron
Norton Co., Worcester, Mass.

CARBURIZING—See Heat Treating

CARLOADERS
Clark Tructractor Div., Clark Equipment Co., Battle Creek, Mich.

CARS—Railway
Iron & Steel Products, Inc., Chicago.

CARS—Industrial and Mining
Atlas Car & Mfg. Co., The, Cleveland.

CASE HARDENING—See Heat Treating

CASTERS
Darnell Corp., Ltd., Long Beach, Calif.

CASTINGS—Acid or Heat Resisting
Ampco Metal, Inc., Milwaukee, Wisc.
Cramp Brass & Iron Foundries Co., Philadelphia.
Duriron Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.
Hoskins Mfg. Co., Detroit, Mich.
Meehanite Metal Corp., Pittsburgh.
Michiana Products Corp., Michigan City, Ind.
Ohio Steel Foundry Co., Lima, Ohio.

CASTINGS—Alloy Iron
Cramp Brass & Iron Foundries Co., Philadelphia.
Michiana Products Corp., Michigan City, Ind.

CASTINGS—Alloy Steel
Advance Foundry Co., The, Dayton, Ohio
Hartford (Conn.) Electric Steel Corp.
Mackintosh-Hemphill Co., Pittsburgh.
Michiana Products Corp., Michigan City, Ind.
National-Erie Corp., Erie, Pa.

CASTINGS—Aluminum
Aluminum Co. of America, Pittsburgh.

CASTINGS—Brass, Bronze, Copper or Aluminum
Bunting Brass & Bronze Co., The, Toledo, Ohio.
Cadman, A. W., Mfg. Co., Pittsburgh.
Carbon Malleable Casting Co., Inc., Lancaster, Pa.
Cramp Brass & Iron Foundries Co., Philadelphia.
National Bearing Metals Corp., Pittsburgh.
Shenango-Penn Mold Co., Dover, Ohio.
Spencer's, I. S., Sons, Inc., Guilford, Ct.

CASTINGS—Bronze
Koppers Co., Bartlett Hayward Div., Baltimore, Md.

CASTINGS—Corrosion Resisting
Cramp Brass & Iron Foundries Co., Philadelphia.
Meehanite Metal Corp., Pittsburgh.
Michiana Products Corp., Michigan City, Ind.
Midvale Co., The, Nicetown, Phila., Pa.
Ohio Steel Foundry Co., Lima, Ohio.

CASTINGS—Die, Aluminum
Aluminum Co. of America, Pittsburgh.

CASTINGS—Electric Steel
Continental Roll & Steel Foundry Co., East Chicago, Ind.
Crucible Steel Castings Co., Lansdowne, Pa.
National-Erie Corp., Erie, Pa.
Ohio Steel Foundry Co., Lima, Ohio.

CASTINGS—Gray Iron
Advance Foundry Co., The, Dayton, Ohio.
American Engineering Co., Philadelphia.
Cramp Brass & Iron Foundries Co., Philadelphia.
Dodge Mfg. Corp., Mishawaka, Ind.
Koppers Co., Bartlett Hayward Div., Baltimore, Md.
National Roll & Fdry. Co., Avonmore, Pa.
North Wales (Pa.) Mach. Co., Inc.
Spencer's, I. S., Sons, Inc., Guilford, Ct.

CASTINGS—High Test & Alloy Iron
Cramp Brass & Iron Foundries Co., Philadelphia.
Meehanite Metal Corp., Pittsburgh.

CASTINGS—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

CASTINGS—Malleable
Carbon Malleable Casting Co., Inc., Lancaster, Pa.
Lake City Malleable Co., The, 5100 Lakeside Ave., Cleveland.
Malleable Iron Fittings Co., Branford, Ct.
Peoria (Ill.) Malleable Castings Co.

CASTINGS—Manganese, Steel and Alloy
Pettibone Mulliken Corp., Chicago.

CASTINGS—Meehanite Metal
Meehanite Metal Corp., Pittsburgh.

CASTINGS—Monel & Nickel
Cramp Brass & Iron Foundries Co., Philadelphia.

CASTINGS—Semi-Steel
Cramp Brass & Iron Foundries Co., Philadelphia.
Malleable Iron Fittings Co., Branford, Ct.

CASTINGS—Steel
American Rolling Mill Co., Middletown, Ohio.
Bethlehem (Pa.) Steel Company.
Birdsboro (Pa.) Steel Foundry & Machine Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Continental Roll & Steel Foundry Co., East Chicago, Ind.
Crucible Steel Castings Co., Lansdowne, Pa.
Hartford (Conn.) Electric Steel Corp.
Mackintosh-Hemphill Co., Pittsburgh.
Malleable Iron Fittings Co., Branford, Ct.
Mesta Mch. Co., Pittsburgh.
Michiana Products Corp., Michigan City, Ind.
National-Erie Corp., Erie, Pa.
Ohio Steel Foundry Co., Lima, Ohio.
Standard Steel Wks. Co., Phila., Pa.
Steel Founders' Society of America, Cleveland.
Strong Steel Foundry Co., Buffalo, N. Y.

CASTINGS—Wear Resisting
Meehanite Metal Corp., Pittsburgh.

CEMENT—Acid-Proof
Nukem Products Corp., 68 Niagara St., Buffalo, N. Y.

CEMENT—Polishing Wheel
Harrison & Co., Haverhill, Mass.

CEMENT—Refractory
Carborundum Co., The, Perth Amboy, N. J.
Johns-Manville Corp., 22 East 40th St., New York City.

CEMENT—Rubber
Goodrich, B. F., Co., The, Akron, Ohio.

CHAINS—Conveyor & Elevator
Baldwin-Duckworth Chain Corp., Springfield, Mass.
Link-Belt Co., 300 West Pershing Road, Chicago, Ill.

CHAINS—Power Transmission
Baldwin-Duckworth Chain Corp., Springfield, Mass.
Link-Belt Co., 519 North Holmes Ave., Indianapolis, Ind.
Whitney Chain & Mfg. Co., Hartford, Ct.

CHAINS—Roller
Baldwin-Duckworth Chain Corp., Springfield, Mass.
Link-Belt Co., 519 North Holmes Ave., Indianapolis, Ind.
Whitney Chain & Mfg. Co., Hartford, Ct.

CHAINS—Silent
Link-Belt Co., 519 North Holmes Ave., Indianapolis, Ind.
Whitney Chain & Mfg. Co., Hartford, Ct.

CHAMFERING MACHINES (Gear)
Cimatool Co., The, Dayton, Ohio.

CHANNELS—See Angles, Beams, Channels and Tees

CHECKS—Metal
Cunningham, M. E., Co., Pittsburgh, Pa.
Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

CHEMICALS—Rust Proofing
Alrose Chemical Co., Cranston, Providence, R. I.
Parker Rust Proof Co., 2186 Milwaukee Ave., Detroit.

CHROMIUM METAL & ALLOYS
Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

CHUCKING MACHINES—Automatic
New Britain-Gridley Machine Div., The New Britain Machine Co., New Britain, Conn.

CHUCKING MACHINES—Multiple Spindle
Baird Mch. Co., The, Bridgeport, Conn.
Goss & DeLeeuw Machine Co., New Britain, Conn.
National Acme Co., The, Cleveland.
Potter & Johnston Machine Co., Pawtucket, R. I.

CHUCKS—Drill
Cleveland (Ohio) Twist Drill Co., The.
Cushman Chuck Co., Hartford, Conn.
Morse Twist Drill & Mach. Co., New Bedford, Mass.

CHUCKS—Drill, Quick Change
Apex Machine & Tool Co., The, Dayton, Ohio.

CHUCKS—Electric
Cushman Chuck Co., Hartford, Conn.

CHUCKS—Lathe
Cushman Chuck Co., Hartford, Conn.

CHUCKS—Magnetic
Heald Machine Co., Worcester, Mass.
Taft-Peirce Mfg. Co., The, Woonsocket, R. I.

CHUCKS—Tapping
Apex Machine & Tool Co., The, Dayton, Ohio.

CLAMPS FOR FIXTURES
Detroit (Mich.) Stamping Co.

CLEANERS—Metal
American Chemical Paint Co., Ambler, Pa.
Detroit Rex Products Co., Detroit, Mich.
Ford, J. B., Co., The, Wyandotte, Mich.

CLEANING COMPOUNDS—Alkali
Detroit Rex Products Co., Detroit, Mich.

CLEANING EQUIPMENT—Metal
Detroit Rex Products Co., Detroit, Mich.

CLEANING EQUIPMENT (METAL)—Electro-Chemical
Bullard Co., The, Bridgeport, Conn.

CLUTCH-BRAKES—Magnetic
Kieckhaefer Corp., Cedarburg, Wisc.
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

CLUTCHES
Falls Clutch & Mchry. Co., The, Cuyahoga Falls, Ohio.
Foote Bros. Gear & Machine Co., 5301 H So. Western Blvd., Chicago, Ill.
Medart Co., The, St. Louis, Mo.

CLUTCHES—Friction
Dodge Mfg. Corp., Mishawaka, Ind.
Twin Disc Clutch Co., Racine, Wis.

CAST IRON PIPE

North Kingston, R. I., has started surveys for a water system to cost approximately $225,000. Jenks & Ballou, 2600 Independence Trust Building, Providence, R. I., are engineers.

Saugus, Mass., contemplates a water system. Fay, Spofford & Thorndike, 11 Beacon Street, Boston, are engineers. Edward Gibbs, Jr., is chairman of Board of Selectmen.

Fairhaven, Mass., has tentative plans for a water system. Water Department has engaged Frank A. Barbour, 1119 Tremont Building, Boston, to draw plans.

West Boylston, Mass., plans pipe line extensions in water system; also installation of steel standpipe, pumping machinery and other waterworks equipment. Cost over $135,000. Whitman & Howard, 89 Broad Street, Boston, are consulting engineers.

Fairhaven, Mass., plans pipe line extensions and replacements in water system. Surveys and estimates of cost are being made. F. A. Barbour, 73 Tremont Street, Boston, is consulting engineer.

Morristown, N. J., plans pipe line extensions in water system in Reynolds Avenue and other streets. Cost about $50,000.

General Purchasing Agent, Panama Canal, Washington, closes bids May 24 for 2400 ft. of 2-in. cast iron soil pipe, cast iron soil pipe fittings and other pipe fittings (Schedule 3465).

Board of Henrico County Supervisors, Richmond, Va., plans pipe lines for water system in Sanitary District No. 1, including 12-in. pressure line for main supply from Deep Run Creek, source of water, to distribution reservoir, about 11,000 ft. in all, and two 12-in. lines from reservoir to point in Sanitary District. Roswell D. Trimble, American Building, Richmond, is consulting engineer; Robert E. Horton, Voorheesville, N. Y., is hydraulic engineer.

Ravenna, Ohio, plans 1½-in. pipe for new line for auxiliary water service. Cost about $40,000. Department of Public Service is in charge.

Scooba, Miss., plans pipe lines for water system and other waterworks installation. Surveys and estimates of cost are nearing completion. Special election will be called soon to approve bond issue. John M. Fillan, Jackson, Miss., is consulting engineer.

Newport, Ky., will take bids soon for pipe line extensions in water system, including improvements in pumping station. Cost about $100,000. Fosdick & Hilmer, Union Trust Building, Cincinnati, are consulting engineers.

Westover Hills (Fort Worth), Tex., plans pipe lines for water system and other waterworks installation. A special election has been called to vote bonds for project.

Pine Lake, Ga., plans pipe lines for water system and other waterworks installation. Surveys and estimates of cost are being made. Special election will be called soon to vote bonds.

New Salem, N. D., plans pipe lines for water system and other waterworks installation. Fund of about $137,000 is being arranged through Federal aid for this and sewage system.

Stillwater, Okla., plans main pipe line from Lake Carl Blackwell to municipal filtration plant. Cost about $40,000.

Mesa, Ariz., has awarded 260 tons of 2, 4, and 6-in. pipe to United States Pipe & Foundry Co., San Francisco.

Long Beach, Cal., has awarded 400 tons, comprising 30,000 ft. of 6-in. and 5040 ft. of 4-in. pipe to United States Pipe & Foundry Co., San Francisco.

Glendale, Cal., has awarded 315 tons, comprising 2800 ft. of 20-in. and 1200 ft. of 12-in. pipe, to United States Pipe & Foundry Co., San Francisco.

Prescott, Ariz., has awarded 400 tons for Goldwater Dam flow line to Pacific States Cast Iron Pipe Co., Provo, Utah.

Spokane, Wash., asks bids May 18 on 185 tons 6-in. pipe.

Burbank, Cal., has opened bids on 15,000 ft. of 4, 6, 8, and 10-in. pipe.

. . . GREAT BRITAIN . . .

. . . *High steel production expected for some months.*

LONDON, May 16 (*By Cable*)—United Kingdom steel output in April was affected by Easter holidays, but was still over 1,000,000 tons, and indications point to high production for several months. Commercial consumers, now realizing that price reductions after June are unlikely, are placing forward orders, though makers are insisting on extended delivery dates.

First arrivals of Australian semi-finished steel are expected shortly, while further quantities have been purchased from the Continent. Scandinavia is buying hematite. Turkey bought 300 railway cars valued at about £500,000.

Continental steel production is increasing to meet the growing demands of major powers. Baltic countries, Sweden, the Far East, and South America have placed good orders.

The Thin Sheet Cartel reaffirmed prices. France rejoined the International Wire Export Cartel.

There is strong demand for tin plate with export orders up to the end of the year. No mills are selling at the official minimum. Quotations go as high as 21s. 6d. f.o.b. Unfilled orders amount to over 5,000,000 base boxes and more mills are restarting.

Black and galvanized sheet makers will be fully occupied for several months on air raid shelters.

United Kingdom imports of all kinds in April amounted to 91,000 tons, of which 3700 tons was from the United States. Scrap imports amounted to 21,000 tons.

Exports of all kinds totaled 146,000 tons of which 6000 tons was pig iron; black sheets, 7000 tons; galvanized sheets, 13,000 tons; tin plate, 26,000 tons.

Changes in British prices, effective July 1, have been announced as follows: Hematite pig iron reduced 5s.; Siemens-Martin acid billets other than silicomanganese increased 5s. and products rolled from these increased 6s. All other prices unchanged.

$1,454,700 Generator Order For Westinghouse

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, received an order for two additional generators for the Boulder Dam power plant which will cost $1,454,700.

. . . PIPE LINES . . .

Shell Pipe Line Corp., Shell Building, St. Louis, affiliated with Shell Petroleum Corp., same address, is contemplating surveys and plans for new 6-in. welded steel pipe line from Bennett and Denver oil field districts, Yoakum County, Tex., to Hobbs, N. M., about 35 miles, for crude oil transmission. Connection will be made with main trunk line of company at latter place. Cost over $200,000 with booster pumping stations and other operating facilities.

Metropolitan Utilities District, Seventeenth and Harney Streets, Omaha, Neb., plans pipe lines for high-pressure gas transmission and distribution in South Omaha area. Cost over $85,000. T. A. Leisen is chief engineer.

Warden, Federal Correction Institution, LaTuna, Tex., asks bids until May 22 for 750 ft. of steel pipe; also for gas pressure regulators, gas stops, gas meters, etc. (Circular 1727).

Socony-Vacuum Oil Co., 26 Broadway, New York, has awarded contracts for new 10-in. welded steel pipe line from Woodriver, Madison County, Ill., to Lima, Ohio, including branch line connecting with recently developed oil field in Illinois basin, about 360 miles, total, for crude oil transmission, dividing work as follows: Eastern section to T. R. Jones, Inc., Magnolia Building, Dallas, Tex.; central section to Shehan Construction Co., Tulsa, Okla.; and Western section to Whittiker Construction Co., Fort Worth, Tex. Cost over $3,500,000 with booster pumping stations and other operating facilities.

American-Michigan Pipe Line Co., Mount Pleasant, Mich., plans welded steel pipe line extensions for natural gas transmission from gas area in Walker and Wyoming Townships, Mich., to Grand Rapids, Mich. Company is a subsidiary of Michigan Consolidated Gas Co., 415 Clifford Street, Detroit, which has filed petition with State Public Service Commission for permission to transport gas between points noted.

Humble Pipe Line Co., Humble Building, Houston, Tex., affiliated with Humble Oil & Refining Co., same addresses, has begun construction with company forces of new 4-in. welded steel pipe line from Woodson oil field, Throckmorton County, Tex., to connection with pumping station near Albany, Tex., about 25 miles, where line will make intersection with main oil transmission line of company to Gulf Coast. Cost close to $150,000.

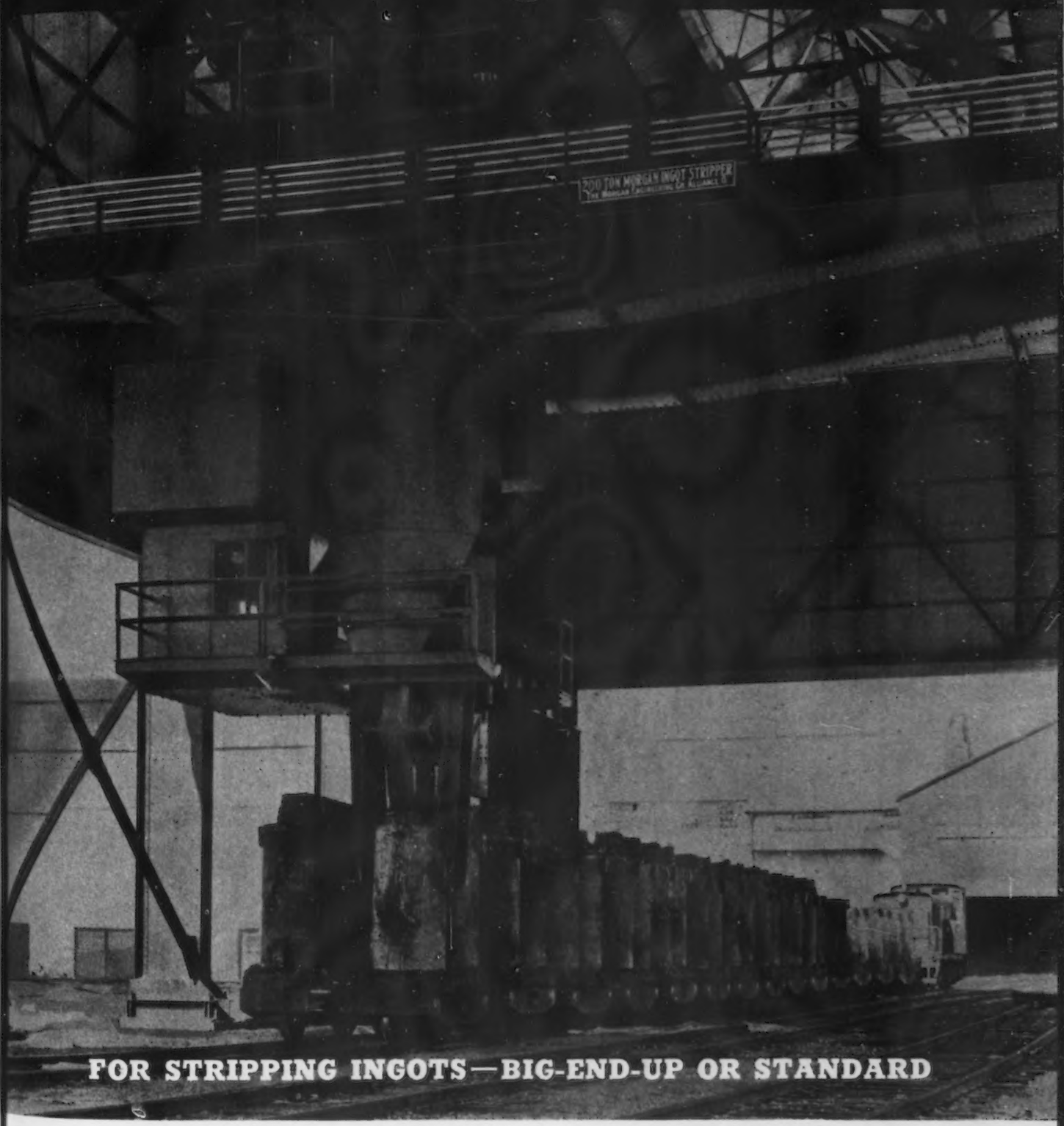
Billings Gas Co., Billings, Mont., plans steel pipe line extensions in gas distribution system in Bridger and Fromberg districts, including replacements in certain existing lines. Cost about $90,000. J. E. Moore is manager.

. . . CANADA . . .

. . . *British orders supporting steel production*

TORONTO, May 16—Dominion Steel & Coal Corp., Sydney, N. S., is making larger shipments of steel to Britain and it is stated that two steamers will be kept busy throughout the summer delivering semi-finished. It also is stated that a new order has been received for rods, bars and tie plates which will keep the mill busy during the summer, but actual tonnage involved is not reported. The Sydney works has reached the highest production in over two years, now having in operation 10 open hearths, two mixer furnaces, one electric furnace and two blast furnaces. With the exception of the rail mill, all mills at Sydney are running three shifts daily.

BUILT BY MORGAN *Engineering*



FOR STRIPPING INGOTS—BIG-END-UP OR STANDARD

• Illustrated is a Morgan 200-ton, 55'-0" span, Universal Screw Type Ingot Stripper at work stripping hot top big-end-up ingots. This same machine will also strip standard or small-end-up ingots without any change in the mechanism. With this arrangement it is possible to strip a mixed heat without any lost time. Efficient, rugged, dependable—such machines play an important part in stepping up steel production.

For full particulars regarding this type of stripper, please ask for Bulletin No. 30-A.

★ **DESIGNERS • MANUFACTURERS • CONTRACTORS**

BLOOMING MILLS • PLATE MILLS • STRUCTURAL MILLS

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★ ELECTRIC WELDED FABRICATION • LADLE CRANES

STEAM HAMMERS • STEAM HYDRAULIC FORGING

★ PRESSES • SPECIAL MACHINERY FOR STEEL MILLS

THE MORGAN ENGINEERING CO., Alliance, Ohio

Pittsburgh, 1420 Oliver Building

★

THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

. . . Better diversification in buying seen in the East . . . Chicago district sales drop off . . . Foreign business has slight edge over domestic volume . . . Better automotive buying activity.

Foreign Buying Has Edge Over Domestic Ordering

CINCINNATI—The local machine tool market is quiet, demand having leveled off at the rate that has prevailed for about three weeks. Currently a small improvement of domestic business is noted with some plants reporting an equal division between home and foreign shipping instructions. On the whole, however, export business is still shading other demand with the indication that a substantial portion is for rearmament purposes. Lathes and millers are still out in front but other types, except drills, are not far behind in consumer interest. Lathe orders included several multiple units, but the bulk of business was for one or two units. Production is unchanged.

Cleveland Builders Report Automotive Buying

CLEVELAND—Market circles hear that recent sales include 10 single spindle hobbers for an automotive manufacturer and threading equipment for Great Britain for shells.

Chevrolet appears to have been more active recently than other divisions of the automotive industry. Several parts makers have ordered single machines, including one plant at Marshall, Mich. Bids on the Drayer plant at Detroit were the highlight of the used machinery market during the past week. Offers of around $20,000 and $22,000 proved too low for this equipment, indicating that the high bid was somewhere in the neighborhood of $24,000.

Vlcheck Tool Co. here plans to spend about $100,000 on a new plastics molding division.

Buying Pace Slackens In Chicago Area

CHICAGO — Little new business has come into this market in the past week. The Illinois Central list of some dozen items, which was reported in the last issue of THE IRON AGE, has not yet been acted upon, but bids closed early this week. In the past seven days Chicago sellers have noticed a slackening, for which there is no apparent reason. Since the first of the year one large seller of used machinery has enjoyed business, which if continued over a year's period, would be satisfactory. Unfortunately, however, it has not been sufficient to balance the periods of depression which usually come throughout a 12-month period, and, in addition, a considerable portion of the bookings were from abroad. This particular company, therefore, and many other vendors of used and new machine tools, who sell extensively for export, will be in a difficult situation when foreign demand abates, unless in the meantime, domestic interest has increased far beyond its present status.

Better Diversification Seen In Eastern Buying

NEW YORK—Some sellers are commenting upon the better diversification of buying that has taken place in the last week or two. Some machine tools have been bought by concerns that have not been in the market for several years or on quotations originally made that long ago. There have been instances, on the other hand, of the inquiry and the order coming through in the same day. Nonmetal working plants are listed among recent purchasers of lathes. Generally, however, the principal buyers are still the aircraft engine and parts manufacturers, and they constitute the entire source of one seller who reports a satisfactory total volume. The future is somewhat uncertain, but present indications point to a month's volume of sales closely equal to that of April.

Shift in Buick Production Presages Machinery Buying

DETROIT—The decision to move production of the Buick-Oldsmobile automatic transmission from the Buick plant at Flint to one of the old Fisher plants on Theodore Street in Detroit has uncovered what appears to be this year's only major program for the buying of machine tools. Design changes are understood to have been made to simplify the transmission so it appears that some new equipment must be bought, although much probably will be moved from Flint to Detroit. Also it has been learned that minor changes are being made in the Buick rear axle. Definite acceptance of leaf spring seats by one major auto company is believed finally to have been made, so F. L. Jacobs Co., the supplier, is expected to proceed on tooling plans shortly. Magnesium Fabricators, Inc., at Adrian, Mich., is reported planning to increase foundry capacity to three or four times the present tonnage. The firm is a new one which has been successful in capturing a great deal of aircraft business in recent months.

Machine Tool Index Declines in April

CLEVELAND—Declines in both domestic and foreign orders forced the April index figure of the National Machine Tool Builders Association down 16 per cent to 155.6 against 185.4 for March. However, the index remained considerably ahead of April 1938 when total orders averaged 90.3. The three months' average trend at the conclusion of April is 169.4, slightly over the March figure of 167.8 and well ahead of the average at the end of April 1938, which was 91.0.

Vlchek Tool Co. Enters Plastics Business

CLEVELAND—Vlchek Tool Co. will enter the plastics business. The company, which produces forged tools, plans to spend approximately $100,000 on new machinery and other plastics equipment, which will make its East 87th Street plant the largest plastics molding plant in this city. A. C. Fulton will be general manager of the new division. Frank J. Vlchek is president of the company.

Machine Tool Builders Issue 32-Page Booklet

CLEVELAND — The National Machine Tool Builders' Association has issued an illustrated booklet of 32 pages, titled "Machine Tools and You."

The text for this economic presentation of the machine tool industry is built around an address given to the Army Industrial College at Washington, by Howard W. Dunbar, past president of the association, who is vice-president and general manager of the grinding machinery division of the Norton Co.

After pointing out how it would be impossible commercially to produce most everyday necessities and luxuries without machine tools, the booklet defines and discusses the five basic arts, the scope of the industry and its plants, management and personnel. Life of machine tools, development of new designs, methods of manufacture and sales problems, are other points taken up.

Twenty-six photographs and several charts illustrate the text. Copies are being sent to libraries, newspaper executives and legislators, and made otherwise available.

the Threat to the Machine

THIS is the first of a series of six graphic presentations dealing with the improved machine as a builder of employment and of mass consuming power.

As these appear from month to month in THE IRON AGE, they will form irrefutable proof of the constructive, social and economic value of invention and improvement as expressed in the use of modern time-saving machines.

This first installment deals with the threat to progress involved in the widespread and alarming present day recurrence of the age-old antagonism to mechanical improvement.

By radio, motion picture and printing press, anti-

millions of Americans from pulpit, platf

MINNESOTA SENATE BILL No. 209, *introduced Jan. 23, 1939:*

"That no person, firm or corporation shall operate and maintain any labor-saving machinery or device without first obtaining from the Secretary of State a license to do so. . . . The license fee shall be $25 per year on each unit. . . . In addition, each such person, firm or corporation shall pay a tax on the use of such machinery of the sum of 25 per cent of the average wage of the person or persons replaced."

JOSEPH O'MAHONEY, *Senator from Wyoming:*

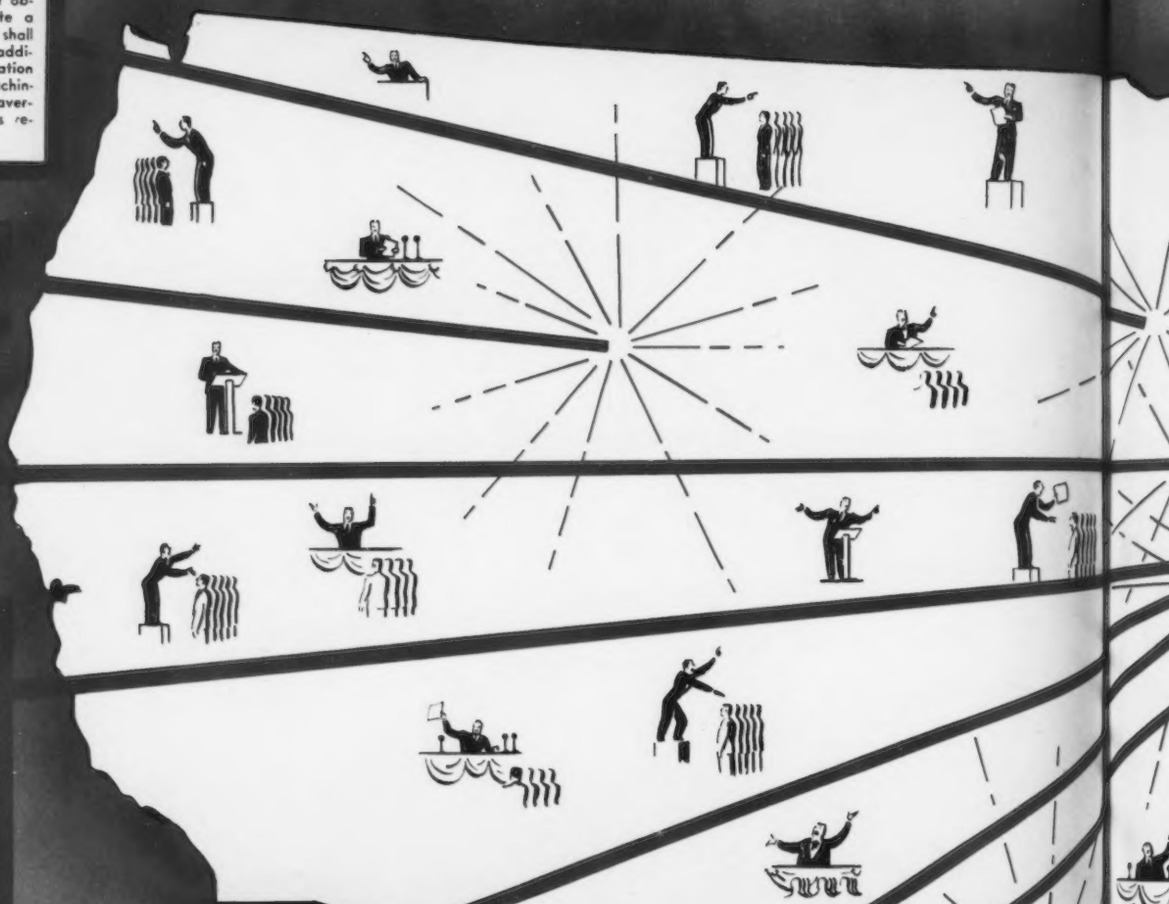
"Science and invention are to blame for the present unemployment in America."

HENRY A. WALLACE, *at the University of North Carolina, May 24, 1937:*

"It is possible to make the machine the servant of man and not the master. But it is going to be necessary to change many of the Governmental rules of the game . . ."

MISSOURI HOUSE BILL No. 483, *introduced Feb. 28, 1939, Section 4:*

"The board is hereby authorized and empowered to investigate . . . the expense of operation of any employer in which any labor-saving device or apparatus is now in use . . . or which hereafter may be installed and which, in the opinion of the board decreases the cost of manufacture and the necessary number of employees . . . in which event the board shall enter a judgment and fix the amount of tax to be levied against such employer at not less than 25 per cent and not more than 50 per cent of the total cost of labor saved by the operation of such device . . ."



U. S. SENATE RESOLUTION S.J.3, *introduced by Senator Champ Clark, Jan. 4, 1939:*

"Resolved: . . . that the Secretary of the Treasury be authorized and directed to conduct an investigation as to the desirability and practicality of the imposition of a tax on the use of labor-saving and labor displacing machinery . . ."

ADOLPH J. SABATH, *Representative from Illinois, on the floor of the House of Representatives, Jan. 14, 1938:*

"The ever-increasing number of new labor-saving inventions in machinery has made a shorter working day absolutely necessary if anything near all our workers are to be employed."

HATTON W. SUMNERS, *Representative from Texas, on the floor of the House, Nov. 23, 1937:*

"There is not anything in the proposition that a labor-saving device puts more people to work. That is all hooey. . . . I am offering the bill to stop the issue of patents on the part of the federal Government in labor-saving devices."

HAROLD L. ICKES, *Town Hall of Washington, Jan. 26, 1938:*

"It is reasonable to suppose that, as time goes on, there will be more and more men unable to find employment for technological reasons."

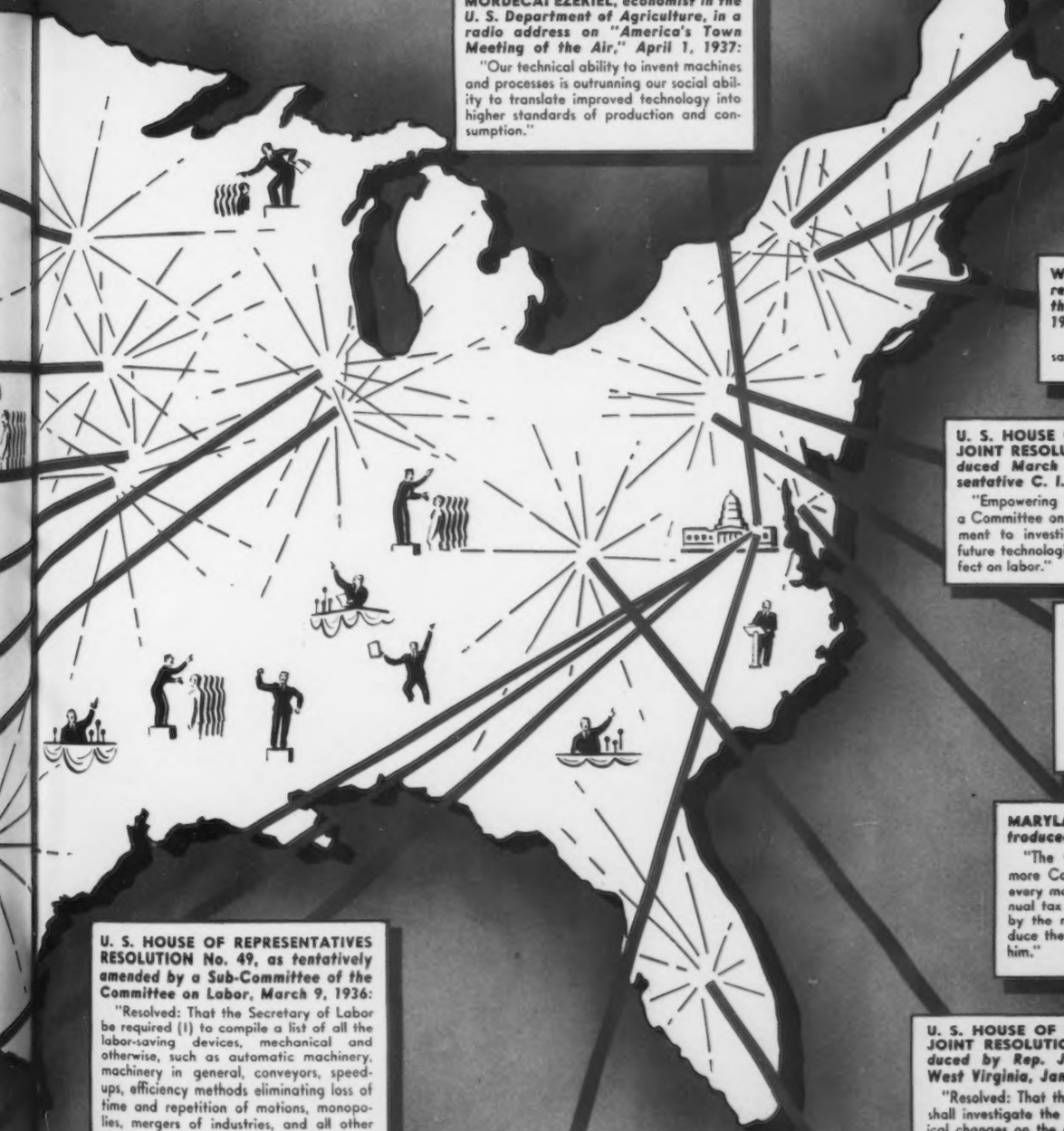
WILLIAM GREEN, *president, AFL, at the Black-Connery hearings, June 4, 1937:*

"Technology accounts for employment lagging behind production."

JOHN L. LEWIS, *CIO and UMW, at the Black-Connery hearings, June 7, 1937:*

"I know of nothing that is a greater burden on the mind of the employed worker and his family than constantly to be facing the possibility of dismissal from employment through the introduction of labor-saving devices."

...est anti-machine propaganda is carried to ...pit platform and legislative halls from coast to coast.



JAMES M. MEAD, *Senator from Ne York, on the floor of the House Representatives, June 24, 1936:*

"The biggest problem in the world tod —unemployment. The cause of the pro lem is technological."

MORDECAI EZEKIEL, *economist in the U. S. Department of Agriculture, in a radio address on "America's Town Meeting of the Air," April 1, 1937:*

"Our technical ability to invent machines and processes is outrunning our social ability to translate improved technology into higher standards of production and consumption."

WILLIAM O. DOUGLAS, *forme Chairman SEC (now Supreme Cou Justice):*

"Over the years we have been preoc pied with materialistic and mechanis matters. The main current of our mode times has been a sweeping advance technology and too often it has ov shadowed all else."

WILLIAM P. CONNERY, JR., *late Representative from Massachusetts, at the Black-Connery hearing, June, 1937:*

"I have always believed that . . . labor-saving devices . . . should be taxed . . ."

U. S. HOUSE OF REPRESENTATIVES JOINT RESOLUTION H.J. 245, *introduced March 28, 1939, by Representative C. I. Faddis:*

"Empowering the President to appoint a Committee on Technological Unemployment to investigate, past, present and future technological changes and their effect on labor."

GEORGE H. EARLE, *Ex-Governor of Pennsylvania, at the Byrnes Committee hearing:*

". . . persons past 40 or 45 find it difficult or impossible to obtain jobs. . . . An outstanding reason, certainly, would seem to be the development of inventions and labor-saving techniques which replace men with machines."

MARYLAND HOUSE BILL No. 208, *introduced Feb. 9, 1939:*

"The County Commissioners of Baltimore County shall levy and collect from every manufacturer and processor an annual tax on the use of any machine used by the manufacturer or processor to reduce the number of persons employed by him."

U. S. HOUSE OF REPRESENTATIVES JOINT RESOLUTION H.J. 31, *introduced by Rep. Jennings Randolph, West Virginia, Jan. 3, 1939:*

"Resolved: That the Secretary of Labor shall investigate the effects of technological changes on the employment of labor . . . shall conduct detailed studies of recent labor-saving devices .... etc., etc."

U. S. HOUSE OF REPRESENTATIVES RESOLUTION No. 49, as *tentatively amended by a Sub-Committee of the Committee on Labor, March 9, 1936:*

"Resolved: That the Secretary of Labor be required (1) to compile a list of all the labor-saving devices, mechanical and otherwise, such as automatic machinery, machinery in general, conveyors, speed-ups, efficiency methods eliminating loss of time and repetition of motions, monopolies, mergers of industries, and all other means adopted toward reducing the cost of production . . . after Dec. 21, 1920, which are still in use and are being constantly improved; (2) to estimate the number of persons in the United States unemployed at the time of completion of such a list by reason of the use of each kind or type of such devices or methods in each of the various divisions of industry, commerce and agriculture; and (3) to report the findings in the House of Representatives together with such observations and recommendations as the Secretary deems pertinent and useful. Every officer or employee of the United States shall be required to cooperate and to supply the Secretary with such information relating to any matter under investigation as the Secretary may request. Such a list of labor-saving devices are to be kept up to date from year to year, with such additions as may be dictated by progress and changes in industry, commerce, and agriculture."

BARNARD BARUCH, *before the Byrnes Committee hearing, Feb. 28, 1938:*

"That there has been a vast replacement of men by machines is beyond argument. . . . I suggest that the whole social security set-up be restudied and that a tax on machine-hours or even on gross sales, rather than payrolls would be more logical. . . ."

CLAUDE PEPPER, *Senator from Florida, in radio address, March 7, 1938:*

"The truth is that ever since machinery has come to be the real producing agency of the world, we have had economic maladjustment."

THUS far in our history there has been no restriction upon American industry in the use of improved machinery. And that is one reason why today the standard of living of an American who is dependent upon relief is higher than the standard of living of a skilled mechanic under either Hitler or Stalin.

But do not be too sure that you will always have this privilege of employing improved machinery.

Twenty million Americans have reached employment age since 1930, and have, therefore, never experienced what we older people believe to be prosperous or even normal times. Of that number, even those who have been able to secure work have existed in the daily fear of losing their jobs.

This "lost generation" is the one that will rule America ten years from now. What is this generation hearing from prominent public people as to the reason for the uncertainties and the anxiety which it has experienced?

It hears Senator Joseph O'Mahoney, for example, say "science and inventions are to blame for the present unemployment in America." It hears ex-Governor George H. Earle, Secretary Harry Hopkins, Secretary Harold Ickes, Senator Claude Pepper, Representative Hatton W. Sumners and dozens of other prominent figures in public life condemn the machine and technological progress as responsible for the difficulties and misfortunes encountered by this "lost generation."

Is it any wonder then that this feeling, so ably promoted, becomes interpreted in legislation? Take, for example, Missouri House Bill No. 483, introduced Feb. 28, 1939, which authorizes the investigation of the expense of operation of any employer in which any labor saving device is now in use . . . or which hereafter may be installed. And which permits an administrative board to enter judgment and fix a tax varying from 25 to 50 per cent of the total cost of labor saved by the operation of such device.

And Maryland House Bill, No. 208, which authorizes the County Commissioners of Baltimore County to levy and collect an annual tax on the use of any machine which reduces the number of persons employed.

And again, Minnesota Senate Bill, No. 209, which requires the obtaining of a license from the Secretary of State be-

FEAR of the machine and efforts to prevent the use of improved machinery antedate even the invention of the steam engine. In the year 1661, a loom was set up in Danzig which could weave from four to six webs at a time without human aid. In order to prevent this machine from injuring the poor people, the authorities suppressed it and drowned the inventor.

The word sabotage, which means the intentional harming of machinery or slowing down of production, is derived from the French "sabot", meaning wooden shoe. In Belgium, when power weaving machinery was introduced, the workers threw their wooden shoes into the apparatus to damage it and stop its operation. Hence the word "sabotage".

In the first number of THE IRON AGE, published in 1855, there was a serious discussion of whether there would be much opportunity for further im-

provement in a world already so perfected. This was before the invention of the Bessemer converter, which was the starting point of the steel industry. And shortly after the Civil War one of our Commissioners of Patents stated that there was little use of continuing the Patent Office since most everything worth while had already been invented.

Apparently machinery has been a traditional "goat" for the ills of mankind, however incurred. For the Encyclopedia Britannica tells us that in the early days of the power loom, workers destroyed the machinery, burned the mills and "blamed the power loom for the distress occasioned by war and political disturbances".

It is an interesting speculation as to whether we would be better off today, had these early advocates of improvement-prevention and machine-restriction had their way.

fore any person, firm, or corporation can have or maintain any labor saving machinery or device. In addition, it imposes upon such individual, firm or corporation a tax equal to 25 per cent of the average wage of the person or persons replaced.

A resolution introduced by Senator Champ Clark on Jan. 4, 1939, directs the Secretary of the Treasury to conduct an investigation as to the desirability and practicality of the imposition of a tax on the use of labor saving machinery. Senator Clark, as you know, is a conservative Democrat, not a "New Dealer."

At least a half dozen United States congressmen are also known to be working on bills to restrict machinery which will be introduced in the coming months. Some would levy a tax in proportion to horsepower or production, the proceeds of which would be used for old age pensions or unemployment relief. Some would have the Federal Government cease to grant patents on inventions which might be construed as labor saving. There is already a broad policy of curbing the flow of investment funds into industrial equipment, based on the theory that unemployment follows and is caused by purchases of capital goods.

If you will obtain a copy of House of Representatives Resolution No. 49, I think you will have some interesting and significant reading that will open your eyes as to the attitude of our Federal law-makers toward improved machinery. Suffice it to say, that this resolution empowers and orders the Secretary of Labor to compile a list of all of the labor saving devices, mechanical and otherwise, which have been put in operation in the U. S. after Dec. 31, 1920. It requires this department to estimate the number of persons in the United States unemployed at the time of completion of such a list by reason of the use of each kind or type of such devices or methods in each of the various divisions of industry, commerce, and agriculture in the U. S.

Accompanying this resolution is a form to be filled out by users of such machinery for each machine thus employed. A form which is more formidable than your income tax blank and which would require you to list every machine in your plant from a drill press to a continuous rolling mill, and the complete case history of each such mechanism. The number and kind of operations which it has performed.

Before time-saving machines created modern threshing equipment.

Before time-saving machines created the elevator.

Before time-saving machines created modern material handling.

Before time-saving machines created modern building materials.

Their cost. The wages paid to the operators on such operations, either piece work or day work. And so on, *ad infinitum*.

These rapidly growing indications of legislative intent to put the machine on trial and to restrict its liberty if adjudged guilty cannot be dismissed lightly. It is not a matter of "New Deal" philosophy, since the participants in this questioning of technology include conservative Democrats, who are opposed to the New Deal, as well as Republicans. Indeed, politics does not enter into this question. It is a matter of economics and those who advocate the slowing down of the machine are sincere in their belief that such action would benefit the majority of our citizens.

Take, for example, the views of Congressman Charles I. Faddis, of Pennsylvania, as expressed in the Congressional Record of March 29, 1939, extracts of whose remarks are quoted below:

"I am not one of those who wishes to be marked down as being opposed to progress, for I know the benefits that machinery has brought to mankind * * * but I believe that for the past 15 years we have been becoming more and more supersaturated with machinery. Food is improved by a certain amount of salt; more salt makes it unpalatable and still more makes it absolutely inedible.

"If you will take almost any industry of this nation you will find that great inroads among the laborers have been made by machinery. Of course, I realize that there are machines which have been labor creating, such as the automobile, the radio and various others. I realize also that there are certain types of machinery which prevent men from being put at hard and dangerous toil and these are justified. * * * In a great many instances, machinery has been installed *merely to displace men in the interest of time.* The result is unemployment, poverty, distress and labor disturbance.

"It is all very well to attempt to solve this problem by resorting to theoretical answers and trick figures to show that machinery is creating more jobs than it is displacing workers. Such an answer may satisfy those who prefer not to think the matter through. We have our mass of unemployed, which is constantly increasing. It is time we ceased to be lulled into a false sense of security in regard to this matter by the sedative of theory."

The view that machinery should bear a special tax to provide funds for unemployment relief is by no means confined to a few legislators. Note this from the top ranks of business—Bernard Baruch:

THE illustrations on these pages show how we Americans might be spending our working hours today if the advocates of restricting or preventing improvement had succeeded a century ago.

There would probably be no discussion of a 30-hr. working week today, under such circumstances, since it took from 60 to 70 hr. a week to earn a living in the pre-mechanized era.

"That there has been a vast replacement of men by machines is beyond argument . . . I suggest that the whole social security set-up be restudied and that a tax on machine-hours or even on gross sales, rather than on payrolls would be more logical . . ."

A few days ago a building contractor in a small New York town expressed the belief that machinery should be put on a 40-hr. week and taxed. At least 25 newspapers carried the story.

Some of the most powerful brakes on the wheels of mechanical progress are not applied directly to curb technological advance. Laws are passed and others are proposed to solve real or imagined problems, and a by-product of them is stifled mechanical progress.

Basically, most of the proposals for "social legislation" affecting machinery installation and use have to do with national planning—new government control over vast economic and social areas. Policies now in effect or frequently proposed which are threatening technological advance are in general as follows:

1. The patent system is under attack for its alleged contribution to anti-social monopoly. Disturbance of the basic principles of American patent laws opens the door to the use of patent grants for punitive purposes, and to countless other conditions which might not only discourage but prevent technological advance.

2. Federal control of wages, hours and working conditions is predicated largely on the theory that government intervention is necessary to adjust dislocations resulting from technological advance. Public acceptance of this principle is a tacit acceptance of the converse application of it—government control of technological change for the purpose of improving wage, hour and working conditions.

3. Tax policies and legislation affecting investment are already curbing technological advance by decreasing the funds available for research, experimentation and development of new products and industries. The ostensible purposes are to limit alleged excessive plant expansion, excessive profits, which prevent proper distribution of national income, and excessive speculation, which leads to economic and social losses.

4. Corporation licensing by the Federal Government is advanced ostensibly to curb monopoly and to prevent other possible social abuses. This power over corporations, accompanied by other regulations already granted and proposed, leaves the way open to complete dictation as to plant expansions, equipment replacement, expenditures for prod-

The tax problem would be more acute than ever, since there would be no large corporations with taxable profits. Hence we would have either to drastically cut Government costs or "soak" the little fellow.

Of course, there would be no automobiles, radios, moving pictures, electric refrigerators or washing machines, except for those few able to afford "hand made" luxuries.

Before time-saving machines created modern pumping systems.

Before time-saving machines created modern mining methods.

Before time-saving machines created modern road building.

Before time-saving machines created the modern laundry.

uct development and new inventions, which would put control of technological change in the hands of government.

5. The belief that owners enjoy disproportionate benefits from machinery use has led to a wide variety of proposals for special taxes on machinery to raise funds to relieve unemployment. These proposals involve levies on horsepower, dollar investment, hours of use, and the like.

We are living in a "machine age." And if we are to live in a machine age comfortably and happily, we must understand the machine and what it means to living. We must recognize its faults and appreciate its virtues. There is nothing to be gained by throwing mud at it or spreading the whitewash.

Those who accuse the machine of causing unemployment and distress deserve to be answered logically and with convincing evidence to the contrary by those who believe that the machine creates enlarged employment and increased mass consuming power.

Any such answer, to be effective, must strictly avoid what Mr. Faddis calls "resorting to theoretical answers and trick figures to show that machinery is creating more jobs than it is displacing workers." Such an answer must decisively refute the claim that the use of "time-saving" machinery is

concentrating wealth and spreading poverty. It must also explain why there are 10 million unemployed in our highly mechanized United States, if technology does not create unemployment.

Having presented, in this issue, the background of the threat to the machine embodied in legislative thinking, THE IRON AGE will present, from month to month, the case for the defense. We shall endeavor to prove conclusively that "time saving" improvements in mechanization have been and still are the most powerful forces for enlarged employment and increased mass purchasing power that we have available in a modern economy. And that to handicap, restrict or penalize the use of such improvements would be to vastly increase poverty and unemployment.

The next installment of this presentation will appear in THE IRON AGE of June 8.

Illustrations by Harry Johnson